## Machine and Tool BLUE BOOK

AUGUST 1955

NMTBA'S
Hollengreen
". . eliminating
manual labor
from
machine tools."



A HITCHCOCK PUBLICATION

CONTENTS ON PAGES 5 and 6

#### Efficiency in Cutting-off is Important

Practically all machining operations start with pieces cutoff from bars or billets. Hence, inefficiency, or lack of capacity, in the cut-off department can hold up or stagnate the entire plant.

- A. Are all-ball-bearing and provide a quick return; therefore they run FASTER than others on the same work.
- Can apply as much as 1200 pounds feed pressure-two to ten times as much as other hack saws and band saws.
- C. Are fully automatic, requiring no more operator attention than an automatic screw machine; and set-up for any bar size and cut-off length is extremely simple.
- D. Use a non-breakable high speed hack-saw blade — the type of saw blade that produces the greatest number of square inches of metal cut per dollar of blade cost-two to ten times (or more) as much as any band saw.
- E. Because of their exceptional sturdiness, ball bearing reciprocating frame, ability to tension the blade "truly taut", their accuracy is dependable.

If you are not using modern, improved MARVEL NO. 6A and 9A production hack saws, call the local MARVEL field Engineer and get his production and cost estimates on your work—to compare with your experience records.

Formula for Accuracy in Metal

Efficiency of cutting-off operation is measured by MACHINE SPEED FEED PRESSURE LABOR TIME BLADE COST ACCURACY.

Sawing Length ACCURACY : Straightness Squareness Squareness) = (Blade Rigidity Blade Tautness MARVE LANGUAGE BUSING CD.
COLORED ZZ / 400 IN J.S.R. MACHINE TOOL SHOW CHICAGO, ILL

The composite MARVEL High-Speed-Edge Hack Saw Blade-cuts any machinable material efficiently. There is no time lost changing blades for different types of steel; no time lost replacing shattered blades, because MARVEL High-Speed-Edge Hack Saw Blades are positively unbreakable. These superior blades have the finest high speed steel cutting edge welded to a strong alloy steel body. They will stand-up under the highest speeds and heaviest feeds attainable on any make hack saw. Can be safely tensioned tauter than any other blade-cut-off not only straight but also square and with less stock

THE MARVEL NO. 6A AND 9A HEAVY DUTY HACK

ARMSTRONG-BLUM MFG. CO. 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.



#### ELIMINATES EXTRA VALVES AND PIPING

This one important Bel-Air feature completely eliminates the problems of accessory speed control valves and cumbersome extra piping. Bel-Air Valves offer many other significant design features for decidedly better control . . . decidedly better performance. Quick air cylinder response is assured by 50% oversize piped exhausts. All ports are screened for extra protection against abrasive action. Aluminum valve spools literally float on jumbo seals inside a hard-chrome plated sleeve. All models are easily serviced with air lines connected. Available in single or double-solenoid pilot-controlled models in sizes of ½" to ½", 3%", ½" variety of manual or mechanical controls in sizes of ½", 3%", ½"

Also Available in 3-Way Types Bulletin BA-101R Contains Full Specifications Address Dept. MTB-855



1080A

The Bellows Co.

AKRON, OHIO

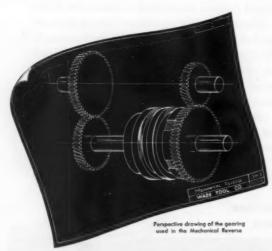
Encircle No. 201 on Card, Opposite Page 65

the Wade REVERSE

#### CONTINUOUS REVERSE

The arrow indicates the location of a feature that is built into the Wade #73, and obtainable on no other second operation machine . . . it's the production-tested Mechanical Reverse.





#### no. 73 Hand Turret Lathe

A single lever mounted on the lathe bed not only controls the high-low spindle speeds of 5-to-1 ratio, but it also actuates the Mechanical Reverse. This lever brakes the headstock spindle and throws it into reverse without stopping and starting the motor!

Cycles of up to 32 reversals per minute allow production increases of as much as 100% on your tap or die work.

If this feature interests you, investigate the full advantages of the Wade No. 73 by writing today for a circular illustrating this versatile machine.

\*Wade Exclusive, Patent applied for write for descriptive folder and prices 51 River St.

PRECISION TOOLS FOR AMERICAN INDUSTRY

Encircle No. 202 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK



#### "The Outstanding Tool Room Lathe"



Precision Collet work for all sizes to 1-1/16" Collet seats directly in spindle.



Precision Step Chucks for diameters up to 6". Provides Collet-like accuracy.

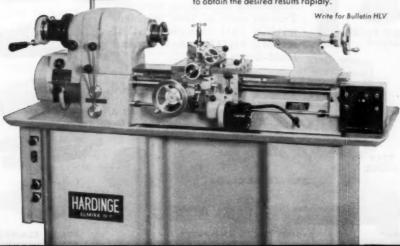


Integral Mount Jaw Chucks for precision holding of regular or irregular shapes up to 5".

Hardinge Model HLV 10" Lathe was primarily designed to fill a very old existent gap between the plain precision bench lathe and the heavy duty engine lathe.

the neavy duty engine rathe.

Extreme accuracy, high spindle speeds,
and thread cutting ability are coupled with power
and ease of operation
to obtain the desired results rapidly.



HARDINGE BROTHERS, INC., ELMIRA, N. Y.

Encircle No. 203 on Card, Opposite Page 65

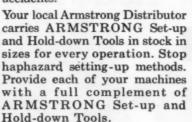
#### ARMSTRON

SET-UP HOLD-DOW Tools



JACKS

ARMSTRONG Set-up and Hold-down Tools reduce settingup time-keep men and machines producing. Designed for use on planers, drill presses, milling machines, etc., they hold work securely and rigidly, and thereby reduce spoilage and prevent costly accidents.







T-SLOT CLA









JACKS

#### ARMSTRONG BROS. TOOL CO.

"The Tool Holder People" W. Armstrong Ave., Chicago 30, U.S.A.

















See us at Booth No. 550, Metalworking Machinery & Equipment Exposition, Chicago Coliseum, Sept. 6-17

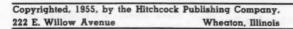
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Aluminum Plaster Casting Process Used in Many New Applications
New Router Fixture Speeds Production More Than 100%
ALUMINUM
Machining Aluminum with Automatic Screw Machines





#### SHOP HINTS

		Grinding		Emergency	Thread	Snap	Gage	180
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#### MODERN TOOLS IN ACTION

World's Biggest Vertical Spindle	Production Up, Costs Down with
Surface Grinder	Carbide Insert Tooling
	Universal Milling Machine with
Worn Valve Plugs Reclaimed by	22" Diameter Quills
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Hitchcock District Managers are Listed on Page 64

Accepted under section 34.64 P.L. & R. Authorized Office, Chicago, Ill.

Only Two Easy Steps . . . Both Amazingly Swift and Efficient

#### FOR FAST PRECISION FINISHING

#### **FULMER HONING** MACHINES

- 1. Honing stones SHEAR off the protuberances from the internal bores . . . then
- 2. FINISH the internal surfaces to geometric accuracy so rapidly that as much as 1/16 inch is removed from the diameter at a rate of 11/2 to 2 cu. inches or more per minute

Fulmer Honing Machines speed cutting and finishing and insure dimen-sional accuracy to tolerance of .0001 ± in every internal honing operation for ferrous and non-ferrous metals, plastics, glass, etc.



Photograph shows Fayscott Corporation of Dexter, Maine, honing spindle sleeves for Giddings & Lewis boring mills.

Write for bulletin on honing

1242 FIRST NATIONAL BANK BLDG.

CINCINNATI 2, OHIO



Style 1B Toolmaster Milling Machine. Equipped with 1 hp spindle head; collet chuck type spindle nose, capacity ½" to 1" shank cutters; power feed to quill; worm positioning of swivel head. Catalog No. M-1870-2.





### CINCINNATI

MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Encircle No. 206 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

#### the shop

The new Cincinnati Toolmaster is the most complimented milling machine on the market today. Everyone has something favorable to say about it:

"A real milling machine."

"Ruggedly constructed; takes heavy cuts."

"We did all the shaping operations required for this expensive die."

"Convenient to operate."

These are actual remarks by foremen, toolmakers and management. There are good reasons why the Toolmaster made such an instant hit with metalworking men . . . its design is based upon an extensive survey among users of light manually operated milling machines: in actual field tests the prototype model was operator-approved for performance, and management-approved as costs receded. 9 Three typical tool and die setups are illustrated here. It's easy to see that there's a place for one or several Toolmasters in your shop. Get complete specs. now; write for new catalog No. M-1870-2.

THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO



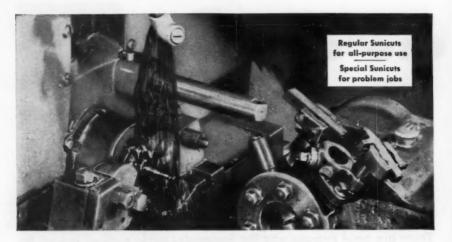
full hp of the motor watching the cutter. progresses smoothly.



Heavier cuts can be The Toolmaster's smooth, accurate The Toolmaster Shaping Attachtaken in one bite on manual feed is a big help in milling ment adds shaping operations to the new Toolmaster, the inside of box-shaped sections the variety of milling jobs handled In this illustration a . . . the operator can readily work by these machines. The illustraheavy cut taxing the with two hands on the controls while tion shows how angular surfaces



are shaped on a Toolmaster.



To assure peak production . . .

#### THERE'S A SUNICUT OIL FOR EVERY SCREW MACHINE OPERATION

Today's Sunicut cutting oils result from years of research and on-the-job testing. And they're versatile, too. In many plants all screw machine jobs are handled by one Sunicut grade.

For the problem jobs, Sun makes a wide variety of special Sunicut oils, each designed to do the job better.

Your Sun representative has the practical know-how to analyze *your* problems. With Sun's experienced engineers, he's ready to help you pick a Sunicut oil that will give you tolerances and finishes you want.

The Sunicut series for screw machines is only part of a large selection of non-emulsifying and emulsifying cutting oils made to help you get peak production at the lowest possible cost.

For complete information about Sun cutting oils see your Sun representative...or write Sun Oil Company, Philadelphia 3, Pa., Dept. MT-8.



INDUSTRIAL PRODUCTS DEPARTMENT

#### SUN OIL COMPANY Philadelphia 3, Pa.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

Encircle No. 208 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK





You get more cuts per sharpening from your tools if you leave metal to support the edge



- Sharpens these cutting edges with any degree of form relief.
- B No undercutting at intersection no burr on work piece.
- Diameters can be cylindrically ground or relieved as desired.

There is a constant increase in the number of shops bringing their tool grinding practices up to date by standardizing on form relief sharpening as a means of reducing tool costs. No other fixture offers the ease of set-up and operation and the flexibility of the "RO" Universal Form Relieving Fixture.

WRITE FOR

ROYAL OAK TOOL & MICHINE CO.

29800 STEPHENSON HY.

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#### **AMAZING PRODUCTION COSTS SAVINGS IMMEDIATELY**



FILTER LUBRICATOR RECOMMENDED

FOR
Drilling
Tapping
Reaming
Spinning
Spot Facing
Fly Cutting
Skip Drilling
Counter Boring
Etc.

DRILL FEED

#### MULTI - SPEED DRILL FEED

Quick, Simple Mounting Does Not Require Skilled Mechanic.

Air Operated-Hydraulic Control or Solenoid Operation—Optional,

Drill Breakage Practically Eliminated at Break Thru.

Tap Life More Than Tripled In Many Instances.

Simple Precise Dial Controls Allow Unskilled Operators To Make Rapid Accurate Set Up.

Foot Control Eliminates Fatigue—Permits Operator To Control More Than One Unit At The Same Time.

Operates in any plane. Has numerous other applications.



For Fatigueless More Accurate Drill Press Production With Less Effort. Specify make and model of your drill press. Dealer Inquiries Invited

D&B AAA1

Manufactured Exclusively by

#### THE GENERAL PACIFIC CORP.

1501 EAST WASHINGTON BOULEVARD LOS ANGELES 21. CALIFORNIA

Encircle No. 211 on Card, Opposite Page 65

#### The TREE **2UV MILL**

gives you these features-

- · Roller Drive
- One Clamp Turret Lock
- Automatic Collet Closer
- **Built-In Power Feed**
- Rapid Traverse
- Labor Saving **Operator Controls**

## plus Versatility

The TREE 2UV Vertical Mill combines rigidity and flexibility to make it one of the most versatile on the market today. The following features make it adaptable to a wide range of jobs:

- Fully universal milling head with power feed
  - Dovetail type ram-360° movable turret
  - Table 101/2"x42" power feed and rapid traverse
  - Hardened and ground lead screws by Ex-Cell-O
  - Ample range: 25" longitudinal, 11" transverse, 171/2" vertical travel
  - Weight—2400 lbs.

Write for complete information . . .

DIE WORKS TREE TOOL AND

1600 JUNCTION AVENUE

RACINE, WISCONSIN

Manufacturers of-MH-4 UNIVERSAL MILLING HEADS TB-4 TAPER BORING TOOLS

Encircle No. 212 on Card, Opposite Page 65

3

## See Danly's New Die Spring Line ...

COMPLETE PRESSURE RANGES TO CHOOSE FROM!



Now, you can design longer spring life into your dies. The new Danly Die Spring Line offers you 235 different springs to choose from—with the range of characteristics you've been looking for. Design of all springs in this new line is based on fatigue testing through millions of compressions at recommended loading and deflection.

Select the die springs you need from the new Danly line and get exactly the deflection, spring rate and size you want.



Shown above is a scread from the new Danly Die Spring Catalog-detailing the simplified apring selection procedure worked out for you.

Encircle No. 213 on Card, Opposite Page 65

#### Send For New Catalog..

The new Danly Die Spring Catalog makes selection of the right die spring easier than ever before. Contains complete pressure and deflection data, as well as dimensions. Here are some of the usual leadures of this catalog:

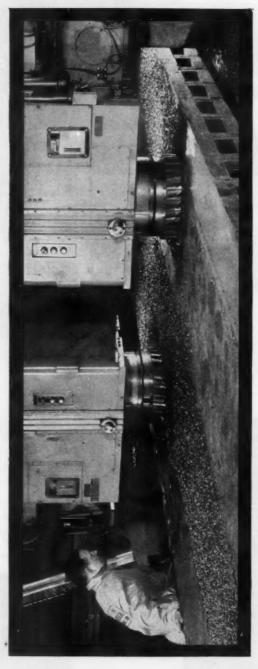
- New Method of Selection... new "step-by-step" selection method simplifies choosing the proper die springs to meet any given problem.
- Simplified Charts the require spring tables are read "straight across" and contain samplete details to minimize confusing cross references. Sand for your FREE copy today.

DANLY

STANDARD OR SPECIAL DIEMAKERS SUPPLIES DANLY MACHINE SPECIALTIES, INC.

2100 South Laramie Avenue . Chicago 50, Illinois

# with Shear Clear Face Mills 00 H.P. and 60"



These 14" Ingersall carbide Shear Clear Face Mills, powered by two motor-driven heads of 150 h.p. each, are shown removing 7/16" of cast iron at feed rates of 60" per minute, more than three times the former rate. This roughing cutter can take up to 1-1/8" of tough metal.

Low Lacond I amon

perience gained through unusual operations designed heavy duty cutters. However, the exsuch as this is reflected in the constant improvement of Ingersoll's standard line of inserted blade milling cutters.

all other types of face mills. Its free cutting, patented Ingersoll Shear Clear will out-perform shearing action permits much higher feed rates, gives you smoother finish and longer tool life. into the Ingersoll Shear Clear race MIII. The

Here are some of the many types of Ingersall Shear Clear Face Mills. Each Shear Clear has been developed for a particular class of work and has variations in cutting angles and blade materials for different metals. All Shear Clear Cutters offer the economies of inserted blade design, and can be furnished in various sizes with carbide-tipped, cast alloy or high speed steel blades.









For Light Cuts of Cast Iron

For Aluminum

For Heavy Cuts of Cast Iron

For General Purpose Milling

Write Today for Ingersoll Cutter Catalog No. 66E.

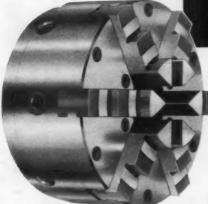
SIMPLE SOURCES OF SPECIAL DESIGN MILLING & BORING MACHINES SHIPPER SHIPPERS OF CLITTERS

NG MACHINE COMPAN

Encircle No. 214 on Card, Opposite Page 65

## You Can Always Beat Higher Machining Costs With

Pat. No. 2,639,157



#### Nothing Like It!

Others try—but unsuccessfully—to provide Buck Ajust-Tru features. The Buck was the first and is still the only practical precision scroll chuck. Make your own comparisons.

#### 6-3-2 JAWS

Whatever your chucking needs on lathes, grinders, dividing heads, and screw machines there's a Buck chuck to handle them up to 9" diameter. Buck AJUST-TRU

- Get dead true precision in one minute, without shims.
- Get .0005" precision, chucking duplicate parts, without further adjustment.
- Handle collet work without collets.
- A End most needs for stub arbors, mandrels, special fixtures.
- Save time ordinarily spent changing from scroll chucks to independent chucks for precision work.

You get all those time saving advantages with Buck chucks plus longer accuracy and longer wear—at conventional chuck prices!
Send for catalog with complete details.

BUCK TOOL COMPANY

712 SCHIPPERS LANE . KALAMAZOO, MICH.

Encircle No. 215 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



BOHLE Herizontal and Vertical Milling Machines. Table sizes:  $11\frac{9}{4}$ "x39\%2" to  $24\frac{3}{4}$ "x98\%2". Herse power  $7\frac{1}{2}$  to 50.





MSO Cylindrical Grinders. Plain, Universal, Mechanical and Hydraulic from 3"x12" to 16"x100".



TRUMPF Curve, cutting-out Shears and Nibbling machines. To  $\frac{3}{6}$ "x49" capacity



WEBO upright-sensitive and multiple spindle drilling machines.



WEBO Radial Drills 91/2" column, 21/2' Arm, 193/4" column, 8' arm.



See These Machines Under Power! **BOOTH 736** Metalworking Machinery Equipment Show CHICAGO COLISEUM, SEPT. 6-17, 1955



OHLER, original seg-mental saw blades to 63" diameter.



Original TRUMPF Liectric Hand Shears Models of 1/16" -3/32" - 1/8" and 3/16" capacities.



Model KA-630 Semi or Full Automatic. or Full Automatic. Capacity to 101/4" Rd.



Model 1500 Saw Sharpening Ma chine .Capacity 7 to 60".



Model KA-400 Semi or Full Automatic. Capacity to 5" Rd.

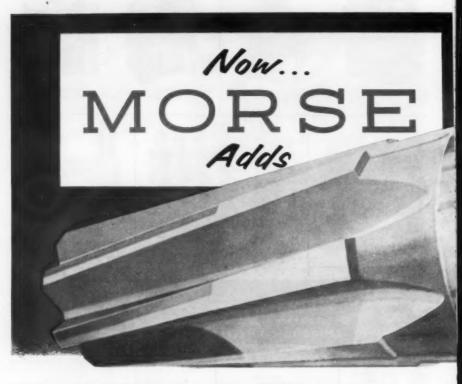
SOME TERRITORIES OPEN FOR EXCLUSIVE AGENCIES

Famous OHLER line includes the Model 1000 machine with capacity 15% Round, 14'' Square and 24'' flat.

#### JAMES W. GEORGE MACHINERY CO.

Machine Tools and Machine Shop Equipment 519 E. JEFFERSON AVE., DETROIT 26, MICHIGAN





#### Line of Cutting Tools ever offered under one name!

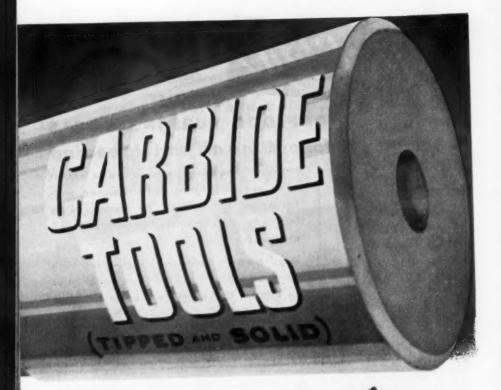
Now, nobody but nobody has a cutting tool line to match Morse in completeness . . . in productive capacity . . . in distribution . . . in engineering service . . . and in the ability to recommend without bias the best cutting tool for every job in your plant, regardless of tool requirements!!

This complete new line of Morse Tungsten Carbide Tools . . . both tipped and solid . . . conforms to Morse standards of quality and precision and is backed by years of experience in Carbide tooling. And, it will be available from your only source of Morse-cost-cutting tools . . . your Morse-Franchised Distributor.

So call him now...get the whole story in detail. It's the most interesting news that anyone in industry has heard since Stephen Morse invented the twist drill!

#### MORSE TWIST DRILL & MACHINE COMPANY NEW BEDFORD, MASSACHUSETTS

(Division of VAN NORMAN CO.)
Werehouses in New York, Chicago, Detroit, Dallas, San Francisco



## Now... MORSE means "THE MOST" in Cutting Tools



#### The Keynote of

#### BOKUM

#### RAPIDOR TURNING TOOLS for cutting off and threading





Carbide-tipped blade

High speed steel blade



Style CO

Style TH-S

In a recent advertisement, we described the features of Bokum Rapidor turning tools for roughing, semifinishing and finishing. Here is the remainder of the Rapidor line: tools for external grooving, cutting off and threading.

They feature interchangeable blades—a fact which guarantees extra-long tool life. The unique design of the clamping of the blade and holder makes the tool rigid, eliminates chatter.

Other applications of Rapidor tools feature cutters for turning forms on the shoulders of a shaft, and radius tracer tools. Angular chip breakers, designed to remove chips away from the operator, can be furnished.



#### BOKUM TOOL CO.

14775 Wildemere Ave., Detroit 38, Mich.

Write today for Catalog 454 for a complete description of Rapidor Tools.

- I Long tool life; blades only need be replaced.
- 2 One holder for all lathe operations; high speed steel and carbide-tipped blades available.
- 3 Cutting, clearance angles are built into the cutter; constant clearance throughout life of tool.
- 4 Shape of cross section remains constant.
- 5 Resharpen top face only.
- 6 No set-up problems.
- 7 Rigid, large chip removal cool cutting action.

a cost cut...with every stroke

of rockford hydraulic-driven



### slotters



higher production is obtained with every stroke because...

the modern Rockford Hydraulic Slotter offers many short cuts in set-up and operation. Cutting speeds are selected from the pendant. Hydraulic cross, circular and longitudinal feeds afford maximum flexibility.

Send us your Slotting specifications, or ask for complete data on Rockford Hydraulic Slotters.



ROCKFORD MACHINE TOOL CO.

2500 KISHWAUKEE STREET . ROCKFORD, ILLINOIS

Encircle No. 219 on Card, Opposite Page 65

PAY-AS-YOU-PRODUCE PLAN Announcing ELI3 WALES Fabricators

Time Payments PAID OUT OF THESE SAVINGS!

ELECTRONIC CHASSIS 12-1/2" x11-1/2", with 118 holes and 4 notches was completed including setup in only 32.45 minutes and subsequent pieces in

6.44 minutes

A part of FARM EQUIPMENT, 72-1/2 x 22 with 32 holes and 72-1/2 to the with 32 holes and cluding setup in only 12.01 minutes, subsequent pieces in 2.32 minutes.

AN AIRCRAFT part 7.1/2" x 4.1/2" with 15 holes and 1 notch was produced including setup in was 55 minutes and subsequent pieces in only 54 seconds.

Part of an ELECTRIC REFRIGER-ATOR, 39-7/8' x a-1.2 with 10 holes and winctices was fabricated holes and winctices was fabricated including setup in only 5.61 min-utes and subsequent pieces in only 37 seconds.

Exclusive

Electro-

## A prime factor in the operating economy



Examine it. See it operate. Try it yourself, Compare it point for point. The Niagara Electro-Pneumatic Clutch is distinctly superior in every respect: hourly output ... ruggedness ... simplicity ... safety ... savings in operation and maintenance. It's functionally different in every major detail! There, in a nutshell, you have one of the principal reasons why Niagara presses continually out-perform all others. For fact-loaded details, as applied to single or double crank inclinable, gap frame, horn and deep throat presses, request specific literature and consult with a Niagara representative.

DISTRICT OFFICES

Buffalo · Cleveland · Detroit · New York · Philadelphia Dealers in principal U. S. cities and major foreign countries

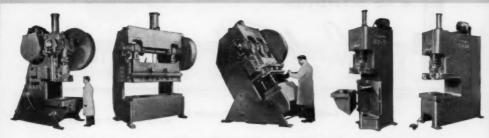
## Pneumatic Clutch greater output, safety and of Niagara Presses

#### For Better Performance and Safety

- ENGAGES AND DISENGAGES INSTANTLY at any point in the stroke.
- CAN BE SINGLE-STROKED, JOGGED (forward and in reverse) or operated continuously.
- STOPS INSTANTLY by push button, electric eye, limit switch or similar devices regardless of crank position.
- PROVIDES EFFORTLESS PRESS OPERATION by palm buttons or foot switch.
- FAILS SAFE. Press stops automatically if electric current or air pressure fails.

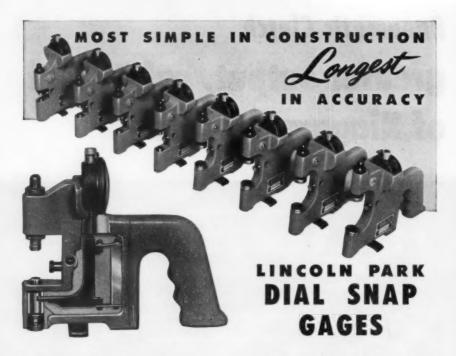
#### For Less Maintenance

- NO FRICTION SURFACES to slip, heat up and wear.
- SIMPLE, COMPACT DESIGN. Nothing to adjust.
- LOW INERTIA. Small in diameter. Operates directly on crankshaft, the slowest rotating shaft. No gears nor high speed shafts, etc. to start and stop.
- LENGTHENS GEAR LIFE. Wear is distributed uniformly, because engagement load is not always applied to same teeth.
- RUNS IN SEALED BATH OF OIL to minimize wear.
- EASILY ACCESSIBLE. Mounted at end of shaft, external to flywheel.
- NO BUCKING of clutch vs. brake



America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

Encircle No. 221 on Card, Opposite Page 65



A complete line of dial snap gages . . . constructed on the simplest design principle . . . guaranteed to maintain extreme accuracy over long periods of time!

Lincoln Park Dial Snap Gages are designed to give a direct reading from the measuring anvil to the indicator. There are no bearings, levers, shafts or cams to

wear or get out of adjustment. Parallel anvils are carbide tipped. Precision adjustments of the upper anvil can be made within a ¼" range. The entire construction is completely shockproof.

A new bulletin describing in detail both standard and special Lincoln Park Dial Snap Gages is now available. Your copy will be sent immediately upon request.

Lincoln

Sincoln Tark

INDUSTRIES, INC.

9 FERRIS AVENUE . LINCOLN PARK 25, MICHIGAN

## Prutton

THREAD : ROLLING : MACHINERY :

#### 9,000 Tubing Nuts Per Hour!

#### **RUNNING 3 SIZES!**

1/2" —20 Thread—5/16" Hole 7/16"—24 Thread—1/4" Hole

3/8" -24 Thread-3/16" Hole





This high speed production operation employed the Exclusive Prutton MANDREL SYSTEM TO SUPPORT THE INSIDE DIAMETER. Similar results can be achieved on your threading with Prutton Thread Rolling Machinery.

Submit your parts for our recommendations. No obligation.

#### Prutton Corporation

5295 WEST 130th ST.

CLEVELAND 30, OHIO

## NO down

CINCINNATI

Photos couriesy Century Mochine Company, 4434 Marbaro Avenue, Cincinnett 9, Ohio

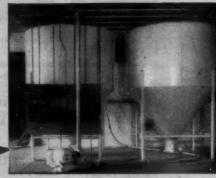
## time in 16 years...



The records of the Century Machine Company show "no down time in sixteen years use" on this Cincinnati Press Brake.

This machine, working a 9½ hour day, forms light gauge sheets in mild and stainless steel up to ½" thickness. It is constantly producing accurate parts for easy assembly of Century's baking ovens and bakery machinery.

Write for New Press Brake Catalog B-4 describing Cincinnati Interlocking All-Steel construction, Centerline Loading, deep rigid beds and rams.



• Flour Storage Bins—each 1000 lbs. capacity

#### THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS . SHEARS . BRAKES



Encircle No. 224 on Card, Opposite Page 65

## MHAT R-B PUNCHES SAVE...



What does this press cost you per hour?

If you use shoulder or set-screw type punches, you have excessive press down-time when replacing worn or broken punches.

But, with R-B interchangeable and standardized punches and die buttons you get quick insertion and removal in the press. The R-B ball lock features, that assure positive radial alignment and vertical locking without further keying, permit greater press utilization.

RICHARD BROTHERS PUNCH DIVISIO ALLIED PRODUCTS CORPORATION Dept. 72 • 12621 Burt Rd. • Detroit 23, Mich	
Please send me additional information.	
NAMETITLE	
COMPANY	
ADDRESS	

Also Produced in
OTHER ALLIED PLANTS
SPECIAL COLD FORGED FARTS
STANDARD CAP SCREWS
PRECISION GROUND PARTS
SHEET METAL DIES
MADE OF FERROUS ALLOYS,
ZINC ALLOYS OR PLASTICS



## "TIP the SCALES" in Your favor — Equip Your Toolroom VER DRILL POINTERS

From almost the instant an OLIVER DRILL POINTER is installed in your toolroom, you will notice its effect upon many aspects of your plant's operations. Expensive automatic equipment will be protected . . . production schedules maintained . . . higher product output assured . . . and increased profits certain.

Drills ground on an OLIVER DRILL POINTER last from 2 to 3 times longer than ordinary hand ground drills. Machine ground to a perfect balance, Oliver ground drills are scientifically correct and theoretically perfect—each lip of the drill performs equal work. Drills ground the Oliver Way cut faster and more accurately . . . produce more perfect holes.

Don't let inefficient drill performance rob



MODEL #21

MODEL #510

THE
MACHINE TOOL
SHOW
CHICAGO, ILL.
SEPT. 9-17, 1893

you of the steady and profitable plant operations you have a right to expect. Eliminate worry and inaccuracy before it begins . . . at the first sign of dullness, remove the drill and machine sharpen it . . . with an OLIVER DRILL POINTER.

Be sure to see the Oliver Line - Booth 604 at The Machine Tool Show.

No. 510 for drills  $\frac{1}{4}$  to  $\frac{3}{-2}$ -4 flute. Variable clearances. Variable point angles. Automatic operation.

No. 21 Oliver Bench Grinder. Hand operated for Drills No. 57 to ½". Right hand, with an improved point. Attachments are available for grinding oil hole drills, left hand and other special points.

"How To Produce More Holes With Your Drills!"
See our catalog in Sweet's Directory

OLIVER INSTRUMENT CO.

1408 E. MAUMEE . ADRIAN, MICHIGAN

MACHINE TOOLS by OLIVER include:

AUTOMATIC DRILL GRINDERS TOOL & CUTTER GRINDERS DRILL POINT THINNERS TEMPLATE TOOL GRINDERS FACE MILL GRINDERS DIE MAKING MACHINES

#### ways **FELLOWS** GEAR INSPECTION **INSTRUMENTS** PAY FOR THEMSELVES



Fellows RED LINERS

Automatically record all gear errors in combination on a chart, from which the nature and extent of each kind of error discloses itself. 3 capacities to 18 inches p.d.



Fellows LEAD MEASURING INSTRUMENTS

Also check crown and taper. Two capacities: 12" and 24" p.d. Chart errors at 500 to 1 magnification. No involved calculations in setting for various helix angles.

MACHINE and TOOL BLUE BOOK

1. Fewer "Rejects"

Fellows Gear Inspection provides positive quality control during production runs . . . puts the finger on gear errors before costly waste occurs.

2. Longer Cutter Life

Competent Gear Inspection routines and instruments help to determine period of efficient cutter or finishing tool performance between sharpenings... prevent over-use and keep stock removal per sharpening at a minimum.

3. Less Production Time Lost

Fellows Gear Inspection identifies the nature of gear errors and permits fast correction...before expensive hours of machine time and labor are wasted."

4. "Fool-Proof" Assembly

Fellows Gear Inspection gives proof-positive that specified gear limits have been met before costly man-hours have been invested in assembly.

5. Improved Customers' Good Will

If you are making gears for your own use... Fellows Inspection
Instruments assure superior gear performance throughout the service
life of your product. If you are making gears for another manufacturer
... Fellows Instruments give you CHART RECORDED PROOF beyond
argument of the delivery of specified precision.

There's a Fellows Gear Inspection Instrument to help every type of operation to increase profits. Why not discuss this important matter with your Fellows Representative soon? If interested, ask him for data about The Fellows Plan for deferred payments. Write, wire or phone any Fellows Sales Office.



Fellows
INVOLUTE
MEASURING
INSTRUMENTS

Feature electronic recorders. Permanent chart records at 500 to 1 magnification. Measures the location and amount of any planned for involute modifications. 12 and 24 inch capacity models.

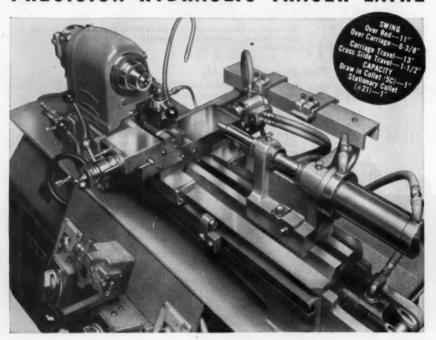
#### GEAR SHAPER COMPANY

Head Office and Export Department: 78 River Street, Springfield, Vermont.

Branch Offices: 319 Fisher Building, Detroit 2 • 5835 West North Avenue, Chicago 39

2206 Empire State Building, New York 1 • 6214 West Manchester Avenue, Los Angeles 45

# ELGIN PRECISION for more than 50 years Announces its NEW PRECISION HYDRAULIC TRACER LATHE



Elgin Tool Works announces the development of its New Hydraulic Tracer Lathe, a precision machine for close duplication of smaller parts in large or small lots. This machine is hydraulic in its primary duplicating functions and includes air operated features to facilitate part loading, unloading and clutch—brake drive operation.

See our Booth No. 320 at the Chicago Coliseum

#### ELGIN TOOL WORKS, Inc.

1772 Berteau Avenue

Chicago 13, Illinois

Encircle No. 228 on Card, Opposite Page 65

36

MACHINE and TOOL BLUE BOOK

## the ONE COMPLETE Tool Line



Yes, one look at Davis and you're sure to agree that here is industry's most complete standard tool line. One quick check of its unparalleled range of types, sizes and cutter materials will convince you that only Davis offers the full advantages of one-source buying for all your boring, turning and planing requirements. Here, too, at Davis you'll see designs from the one engineering group with the vision and background of motal working experience to produce special tooling of outstanding efficiency. So whatever your needs...at the show and in the shop...it's always good advice to see Davis first for the best in tooling.

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DAVIS BORING TOOL Write for YOUR DAVIS CATALOG 304

Giddings & Lowis Machine Tool Company Toud do Lor, Wisconsin

THE ONE NAME THAT CERTIFIES ULTIMATE PRECISION AND PRODUCTIVITY IN TOOLING

#### Shadows of Good Things to Come...







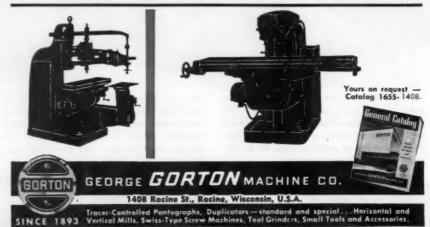
The "good things" are production speed-ups and cost cuts... yours with new Gorton machines. Come to Gorton's booth and see 17 machines operating under production load—many brand new and never before exhibited; some completely redesigned; others with typical Gorton improvements.

#### Included . . .

Gorton No. 2 Horizontal with Receptor Ram and Super-Speed Universal head and ram assembly. Don't miss the *Economy Model*—No. 3 Horizontal with 76" table and 48" table travel.

VISIT GORTON'S Booth No. 1019 (Ground floor, south end of South Hall)

The latest in Tracer Control — manual, semi-automatic and completely automatic within the cutting cycle. Spindle speeds up to 48,000 rpm; hp as required.



A 8479

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MACHINE and TOOL BLUE BOOK

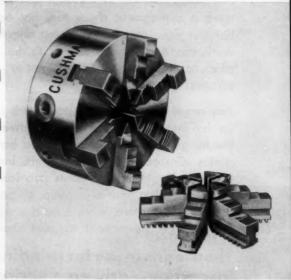
# cushman chucks give Chuck-ability

CHUCK-ABILITY: The ability to SPEED your work
... ELIMINATE fatigue ... IMPROVE your products
... and REDUCE your costs ... through design
and selection of the right work-holding devices.

## . the Le Accra-Set Chucks

- Ideal for precision bar work.
- Quick, simple, minute adjustment.
- Repeats within .0005" or better T.I.R.
- Because of extreme accuracy and jaw capacity, one Accra-Set\* Chuck can replace even the most accurate collet chuck and its range of collets.

\* Patent applied for.



Available with 3 or 6 jaws in 6", 7\(^y\)2" and 9" sizes. Adapter plates required for mounting.

incircle No. 231 on Card, Opposite Page 65

#### THE CUSHMAN CHUCK COMPANY

Hartford 2, Connecticut

a world standard for precision

CUSHMAN CHUCKS . . . a Product of American Quality, Labor and Materials

THAT CHOCKS . . . & Frederic of American Gooling, 1999 and Material

BOOTH NO. 419

Production Engineering Show Navy Pier, Chicago—Sept, 6-17 CHUCKMAN CHUCKMAN

SEE YOUR INDUSTRIAL DISTRIBUTOR

anufacturers of

Air Operated Chucks, Cylinders, and Accessory Equipment... The Cushman Power Wrench... Cushman Manually Operated Chucks and Face Plate Jaws.

## Industry's most versatile Magnetic Chuck

### **MAGNA-SINE**

Here is a magnetic chuck that not only handles your parallel work but angular work, too. And angular set-ups to gauge block accuracy take but a matter of minutes!

Any angle—single or compound—is set up by inserting gauge blocks between the Magna-Sine's precision hinged base plates. Correct blocks to use are indicated in Table of Constants provided. Hours of set-up time are saved, angular accuracy is positive, work is held distortion-free on permanent magnet chuck.

Thousands in use for grinding, inspection, drilling, boring.
Write for free catalog which shows all

styles and sizes . . . price list included.



OMER E.

Kobbins

COMPANY

Dept. A-2, 24800 PLYMOUTH RD. • DETROIT 39, MICHIGAN

Also producers of special gauges and fixtures



SEE AUTOMATION IN ACTION



NEW LATHES



A NEW DRILLING HEAD



A NEW AUTOMATIC LOADER

A NEW DRILLING, REAMING, AND TAPPING MACHINE



CHICAGO, ILL. SEPT. 6-17, 1955



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STRECA FALLS MACHINE COMPANY . SENECA FALLS, N. Y.



SMOOTHER HOLES . . . It's the chips that score up the hole surface. You need polished flute drills to get those chips out.

NEW YORK drills are ground from the solid to a 15 to 20 micro-inch finish and accurately pointed on machines of our own design. These ultra-smooth flutes improve drilling of heat-hardened aluminum, titanium, magnesium and other non-ferrous metals.

NEW YORK drills are made to last longer, give you greater production. You get more holes, all perfectly round, exactly on size, without burrs. That's why so many of industry's largest and most discriminating users specify NEW YORK!

Write now for catalog, technical manual and net prices.

#### NEW YORK TWIST DRILL COMPANY, INC.

MAIN PLANT IN WESTBURY, L. I., NEW YORK

EASTERN HEADQUARTERS: 278 LAFAYETTE STREET, NEW YORK 12, N. Y. MIDWESTERN HEADQUARTERS: 30-A NORTH CLINTON STREET, CHICAGO 6, ILL.

#### Used his head, a \$100 die, and a DAKE Hydraulic Press to reduce cost of cutting job from 88¢ to 9¢ a panel



Jerry Denicola of the Marmora Machine Co., Chicago, believes in using his head to make money. The ways in which he uses his Dake Press should be an inspiration to other machinists.

One of his customers makes flamecutting machines, for which Jerry furnishes steel panels in which an opening must be cut exactly to 1¾" x 2¾" size.

This job was formerly end-milled, and the corners filed square—a job that required a skilled mechanic.

Fifty panels cut this way required 7½ hours labor at \$2.35 an hour, \$17.62 for the run, or 88¢ a panel.

So Jerry made a hardened die at a cost of about \$100, and put the job on his Dake Press. Now a run of 50 panels can be cut in 3 hours by a semiskilled mechanic at a cost of \$1.50 an hour—\$4.50 for the run, or only 9¢ a panel. So every time an order for fifty more panels recurs, there's an extra profit of \$13.12 in it!

You, too, can make an extra profit with a Dake Press . . . see your Dake distributor.

Dake Corporation, 608 Seventh St., Grand Haven, Mich.















Encircle No. 236 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



FLOATING ACTION

ONLY TAPMATIC OFFERS
THIS "WEIGHTLESS TAPPING" FEATURE . . .
Customary Human Lead
Error Is Eliminated . . .
CONSISTENTLY UNIFORM THREADS ARE
ASSURED.

THE WORLD'S MOST VERSATILE TAPPING ATTACHMENTS

COMPLETE

RANGE OF

SIZES FROM

#0-2"

TORQUE CONTROL

TAPMATIC'S EXCLUSIVE
POSITIVE TORQUE AD-

TAPMATIC'S EXCLUSIVE POSITIVE TORQUE ADJUSTMENT CLUTCH STOPS TAP INSTANTLY WHEN TAP BECOMES DULL, LOADED OR BOTTOMS IN BLIND HOLE... Operator Sensitivity No Longer a Factor.

### **TAPMATIC**

CORPORATION

845 West 16th Street · Costa Mesa, California · Phone Liberty 8-3404

#### PLAIN PLUG GAGES \*\* class XXX !!



In response to persistent demand, VK has developed and now announces a new, ultraflerine, plain plug gage tolerance of .00001", designated as Class XXX. This new tolerance, half of that of Class XX, satisfies a need, long evident, for gages to meet part limits finer than .0002", and permitting only ten millionths of an inch total variation on the gage in sizes up to .825" diameter and only fifteen millionths in sizes from .825" to 1.510" diameter. Tolerance may be applied either bilaterally or unlaterally. Inasmuch as Class XXX tolerance must take into account such factors as finer diameter variation, a high order of roundness

control, an exceptional surface finish and an extreme resistance to wear (all of which offset the shallow wear depth inherent in such a gage class), Class XXX is offered in only Chromium Plated and Carbide Gages.

VK Class XXX Plain Plug gages are furnished in the materials, styles and ranges shown in boxed panel above. VK also furnishes Class XX, X, Y and Z standard tolerance plug gages in wire type, taper lock and trilock designs. For complete information address: The Van Keuren Company, 177 Waltham St., Watertown, Mass.

"Quality in Millionths"



## THE Van Keuren co.

#### 177 WALTHAM ST., WATERTOWN, MASS.

Light Wave Equipment • Light Wave Micrometers • Gage Blocks • Taper Insert Plug Gages • Wire Type Plug Gages • Measuring Wiree • Thread Measuring Wires • Gear Measuring System • Shop Triangles • Carboley Cemented Carbide Plug Gages • Carboley Cemented Carbide Measuring Wires • Chrome Carbide Taper Insert Plug Gages





#### How to keep jobs cool every day of the year...

... SWITCH TO CIMCOOL°, the radically new and different cutting fluid that cools so fast tools and chips actually stay cool to the touch. And here are two more reasons why CIMCOOL Concentrate has become, in just a few short years, the largest selling chemical cutting fluid in the world:

- CIMCOOL LOWERS COSTS because it's longer lasting in machines. Thus, it reduces down-time and cuts labor costs for cleaning and changing.
- CIMCOOL DOES A BETTER JOB because of its chemical lubricity. It permits faster speeds and increases tool life, for it combines friction reduction and cooling capacity in a degree never before attained.

We'll be happy to supply information on the many specific advantages of CIMCOOL Concentrate—or details on the entire family of CIMCOOL Cutting Fluids. Just contact us. Wire, write, or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

\*Trade Mark Reg. U.S. Pat. Off.

#### CIMCOOL CUTTING FLUIDS

CIMCOOL Concentrate—The famous pink fluid which still covers 85% of all metal cutting jobs. Effective, economical and clean.

CIMCOOL Tapping Compound—Permits the use of highest tapping speeds and increases tap

life amazingly.

CIMPLUS—The transparent grinding fluid with exceptional rust control. Also used for machining cast iron and as a water conditioner with CIMCOOL Concentrate.

CIMCUT Base Additive—For jobs requiring an oil-base cutting fluid. Added to mineral oils, it gives an economical mix for higher speeds and feeds.

CIMCOOL Bactericide—The most effective agent yet developed to overcome rancidity and foul odors.

CIMCOOL Machine Cleaner — The two-phase non-corrosive cleaner that removes grit, dirt, slime and oil.

CIMCOOL Cutting Fluids for De of all metal cutting jobs

TOUL WORK NY. C. SER NO.

Modern MC

Collapsible Tap



Stationary and Rotary, and in five sizes ranging from 1516" to 312", these New MC Taps have more new features—money saving features—than we can tell you about in this ad.

The complete story is in Bulletin M-113, It's yours for the asking, Mail this coupon today!

# modern tool works

CONSOLIDATED MACHINE TOOL COMPANY ROCHESTER, NEW YORK

CONSOLIDATED MACHINE TOOL CORP. MODERN TOOL WORKS DIVISION 565 Blossom Road, Rochester 10, N. Y.

Please send me without obligation your new Bulletin M-113 giving full information on modern MC Collapsible Taps.

Vame.

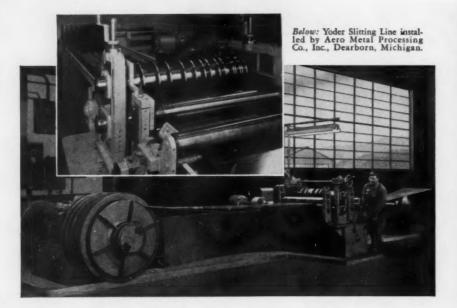
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7066

Tone

A DIVISION OF FARREL-BIRMINGHAM COMPANY, INC.



#### When is a Slitting Line Profitable?

Many variables are to be considered in determining where and when a slitting line becomes a good investment. Also of what size, type, speed it should be, and other special features required to make it most profitable under any given set of conditions. Without obligation, a Yoder representative will call upon request and discuss such details with you.

The Yoder Slitter Book deals extensively with basic considerations in the choice and operation of slitting lines; points out, for instance, how and where a relatively small, inexpensive installation

may be more economical than a larger, faster, and costlier one. (Yoder makes all types). Time studies show how coil size, strip gauge, slitter speed, coil handling and banding time affect cycle time and cost per ton.

The book is useful not only to present operators of slitting lines but to producers, users and distributors of strip and sheet metal who may be considering installing slitting equipment. A copy is yours for the asking.

#### THE YODER COMPANY

5509 Walworth Ave. • Cleveland 2, Ohio

#### Complete Production Lines

- \* COLD-ROLL-FORMING and auxiliary machinery
- \* GANG SLITTING LINES for Coils and Sheets
- \* PIPE and TUBE MILLS-cold forming and welding



## UNDERCUT BURRS COSTS

with this NEW controlled CHAMFER TOOL-

1. Overtravel feature, controls variation in part thickness, part positioning, or ex cessive over-feed of spindle.

C Land 2. Independent collars provide separate adjustments for upper and lower chamfer.

3. Remove single pin to replace low-cost cutter.

4. Thrust collar permits locating against work surface, as spindle is piloted into part.

BURRAMATIC TOOL WILL

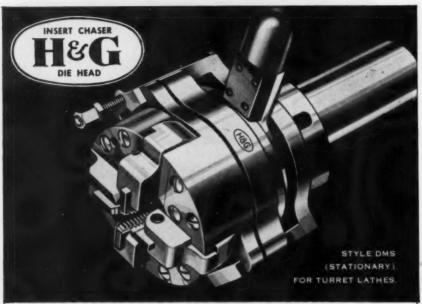
- · Reduce rejections by producing uniform chamfers.
- Save down time with independent chamfer adjustments.
- Increase cutter life with camactuated blade.

**Enlarged view** showing top and bettom

COGSI

TOOL PRODUCTS, INC. 12980 W EIGHT MILE ROAD Oak Park 37, Michigan

Encircle No. 242 on Card, Opposite Page 65



Style & Sizes for All Machines on Which Threads Are Cut

## This die bead is unique THERE IS NO OTHER LIKE IT

It cuts threads with insert chasers. These are, in reality, small sections of the business end of large and expensive chasers, but with this important difference: their cost is so low they can be even thrown away when dull. For example, for less than \$40 you can get a dozen sets of insert chasers, each set ground ready to go. Change now to insert chaser die heads and watch your performance improve. "SELECTING THE PROPER DIE HEAD FOR THE JOB" sent free on request.

THE EASTERN MACHINE SCREW CORPORATION 25-45 Barclay St. New Haven, Conn.



#### BRYANT B-21 THREAD GAGE

checks internal and external threads 8 to 10 times faster!

Car door handles - Checking internal groove diameter and the relation of groove to a face.



Shell Noses - Checking internal thread and concentricity of a bore to the thread

You can speed up quality control and reduce inspection costs with the Bryant B-21 Bench Gage. Partially turning the work inspects the thread—with utmost accuracy—with visual indication of assemble-ability!

This Bryant gage checks threads in all tolerance classes and in sizes ranging from \$\frac{1}{16}" to 5" diameter for internal threads and \$\frac{1}{2}\$ to 5" diameter for external threads.

The gaging contacts are a pair of threaded segments, which are interchangeable to cover a wide range of diameters. Both "Go Form" and "Pitch Diameter" segments are available. These segments have a much longer life than conventional plugs and rings. Attachments for checking squareness-of-face and concentricity in relation to the axis of a thread are also available.

Write for data sheets on the B-21 Thread Gage and other Bryant gages.



Spark plugs - Checking an external thread and the concentricity of an angular seat to the axis of the thread.

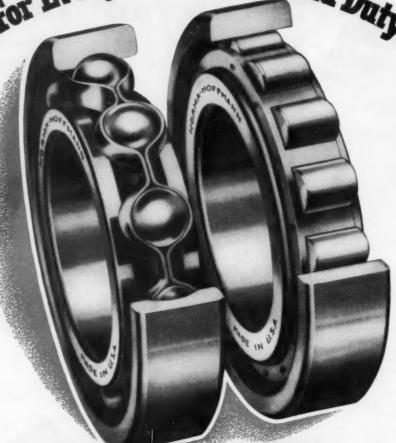


Telephone Handset - Checking external thread.

Bryant Gage and Spindle Division, Box 620E, Springfield, Vermont, U. S. A.

Division of Bryant Chucking Grinder Co. Machine Tool Show Booth 1015

For Every Load, Speed and Duty



#### WVRMA-HVFFMANN

Precision Bearings

BALL, ROLLER, THRUST-3000 SIZES

HORMA-ROFFMANN



JUST AS A NEGATIVE guarantees you an exact duplication of a photograph each and every time, you are always assured a

#### NOW!

#### Cincinnati **Grinding Wheels**

A manufacturing achievement that will save you money and increase your production ...



offer POSITIVE DUPLICATION of an original grinding wheel every time through the CINCINNATI (PD) Manufacturing Process.



#### POSITIVE DUPLICATION

It's the greatest grinding wheel development in years! For through the CINCINNATI (PD) Manufacturing Process you are assured a Positive Duplication of the original wheel every time you reorder.

"On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike. Yet they are priced no higher than ordinary wheels.

Let us prove to you how CINCINNATI (PD) WHEELS can save you money and increase your production. Just contact us and we'll send one of our representatives-

men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.





Encircle No. 246 on Card, Opposite Page 65

# Tools – and operators – keep their tempers with Norton wheels

Only Norton builds these value-adding, time-saving "TOUCH of GOLD" features into wheels for tool room grinding



All teeth stay the same height when you sharpen milling cutters with long wearing, free cutting Norton G Bond wheels that hold size all the way round. The machine is a Norton No. 20 Cutter and Tool Grinder.

#### NORTON GENERAL PURPOSE WHEELS

Out-of-the-ordinary wheels for your ordinary bench or floor stand grinding. Available in the abrasive-and-bond combinations you need for economical, trouble-free performance. Chances are that any tool wheel or general purpose wheel you require is carried in stock.



Exclusive precision processing gives Norton tool room grinding wheels unusual advantages, including controlled uniformity and built-in balance, that reduce vibration and assure smoother running wheels.

#### Plus The Famous G Bond

Also, you can get these wheels in the most efficient vitrified bond ever produced — the Norton G Bond, developed especially for precision-grinding the hardest tool steels. G Bond wheels: cut freer, cooler, faster... do more work per wheel... hold corners better, are better for form grinding, dress easier and grind more pieces per dressing.

And for rapid stock removal, with especially cool cutting action, Norton 32 ALUNDUM\* abrasive is outstandingly popular. All G Bond wheels reduce tool spoilage, give you closer tolerances and smoother finishes, with fewer wheel changes and machine adjustments — additional "Touch of Gold" benefits that mean better performing tools and better, lower-cost tool room grinding.

#### For Your Carbide Grinding

Norton diamond wheels, carbide grinding's recognized "Crown Jewels", are made in all required bond types. Their accurate cutting action and extra long service life bring you top savings in every single point and multi-tooth carbide grinding application. Also available are CRYSTOLON\* wheels green or gray — with the cost-cutting K Bond.

#### See Your Norton Distributor

Or write direct. And remember: only Norton brings you such long experience in both grinding wheels and grinding machines to help you produce more at lower cost. NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone book, yellow pages. Export: Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

\*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

W-1661

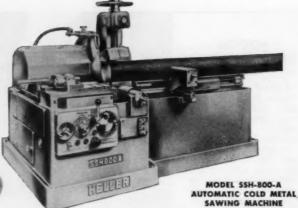


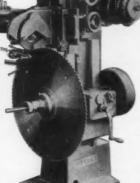
Making better products... to make your products better

#### and its BEHR-MANNING division

NORTON COMPANY: Abrasives Grinding Wheels Grinding Machines Refractories
BEHR-MANNING DIVISION: Coated Abrasives Sharpening Stones Pressure Sensitive Tapes







MODEL B-650 AUTOMATIC SAW SHARPENING MACHINE

# CENTRALIZED RESPONSIBILITY assures TRIPLE ECONOMY with HELLER

- 1. The Cold Sawing Machine
- 2. The Blade Sharpener
- 3. The Circular Sawblade



HELLER GIVES YOU COMPLETE SERVICE WITH EXACTLY CORRECT BLADES.

Economies are effected on every operation involved in cold metal sawing by taking advantage of the complete service available through Heller.

The specific savings offered by use of the combination of Heller Cold Metal Saws, Heller Blade Sharpeners and recommended Sawblades becomes accumulative when used with each other.

Encircle No. 248 on Card, Opposite Page 65

HELLER MACHINE COMPANY, 114 Liberty St., New York 6, N. Y.

KNEE AND PLANER TYPE MILLING MACHINES .

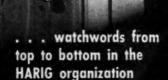
DRILLING MACHINES . TRANSFER MACHINES

RADIAL AND COLUMN

SPECIAL MACHINES

# ecuracy precision

Comparing piece parts with tolerance drawings on Bausch & Lomb and Jones & Lamson comparators.



For over a quarter century, Harighas provided America's metal working industry with the finest precison tools man can devise. Highly skilled craftsmen combine their total of more than 1000 years of experience to guarantee you quality that pays off in your production line.

Carbide, lamination, molding and stamping dies, gages, fixtures, jigs, or special machining — whatever your need, you can depend on Harig to deliver a built in bonus of excellence.



For further information on how Harig planning and designing can help solve your production problems, write for this completely illustrated catalog of plant facilities and services.

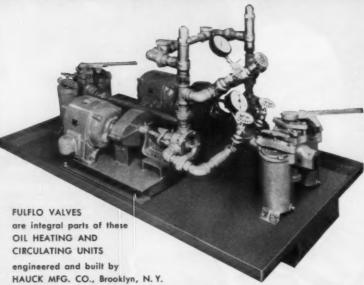


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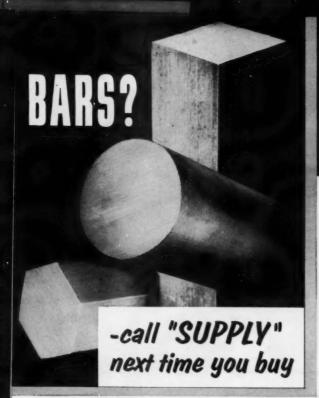


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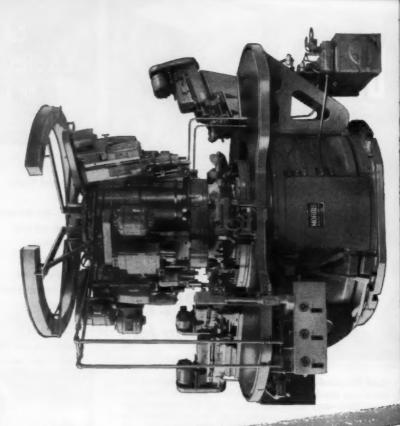
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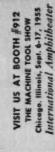
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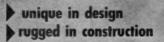
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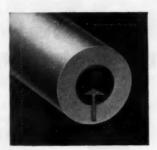
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a hole here wastes time...



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PORTLAND MACHINE TOOL

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MACHINE and TOOL BLUE BOOK



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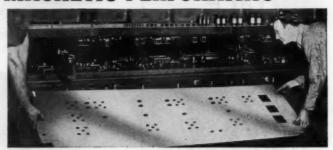
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### Featured in this issue

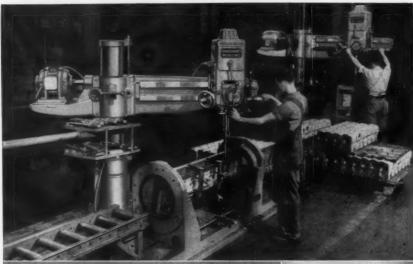
- 1. An interview with Milburn A. Hollengreen, president, National Machine Tool Builders' Association and president of Landis Tool Co. Mr. Hollengreen outlines the general program of the 1955 Machine Tool Show at Chicago. He reviews the work involved with putting on a show of this size, and also what the manufacturers hope to realize by participating in the gigantic exhibition.
- 2. New Profits Through Depreciation, by Victor G. Morris. A careful look at obsolescence when figuring depreciation may mean a financial gain for your company. Page ...... 101
- 3. 1955 Machine Tool Show Will Unveil Many New Techniques and Developments. A preview of the highlight of the year for the metalworking industry, the three great Chicago shows to be held Sept. 6-17. Page ....
- 4. Chicago & District Motel Directory. For the convenience of show attendants, this list of motels in the Chicagoland area gives
- 5. List of Exhibitors at the Machine Tool Show. So that visitors to the three shows may readily find booths in which they are particularly interested, exhibiting companies with their booth numbers are listed in alphabetical order. Page ...... 114

Cincinnati Hydrospin Automatically Cold Spins Cones and Tubes. Forming process in which a workpiece is forced to take the shape of a hardened, rotating mandrel is

Machining Aluminum with Automatic Screw Machines. Gives helpful suggestions for working out individual problems. Article discusses machine tooling, types of tools used, high speed steel tools, cemented accomplished with this machine. Page 134 carbide cutters, tool angles. Page .... 156

### Next Month — The Annual Show Issue

Be sure to read the September issue of the MACHINE and TOOL BLUE BOOK for data on all products to be shown at the three Chicago shows. Also included will be: lists of exhibitors, personnel, booth numbers, maps, other information pertinent to the shows.



years of operation with NO MAJOR MAINTENANCE





Camshaft Housings for new Caterpillar DW21 Wheel-type Tractor illustrated in insert picture, showing casting before and after drilling operations,

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Write for Catalog R-21-C.





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Cincinnati 9, Ohio, U.S.A.

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### AS THE Editor SEES IT

### The Genius and the Mechanical Brain

A few years ago a young fellow lived in our neighborhood whom we considered a wizard at mathematics. As a matter of fact, we labelled him the "math genius," and as a result of his scholastic standing most of the mothers in the community used "that nice, smart boy" as an example to their fledglings.

We weren't particularly envious of this wondrous little fellow because we could run faster and swim further than he could. And the only embarrassment he caused us was during school hours and that certain time of month when report cards were dispatched home.

A few days ago business unexpectedly took us into the office of the "math genius" where we found him a highly successful accountant with a battery of subordinates that would impress an army colonel. He was eager to show us his department and we meekly followed him around as he pointed out the latest in electronic accounting machines. Frankly, we were surprised to find how little he had to do and how much of his work was done by the machines.

While watching an I.B.M. machine that counted, sorted, remembered and produced long sheets of figures, our old school mate remarked: "It would be a wonderful thing if man could think as fast as that machine."

Up to this point we had always considered old "math genius" as a guy with a 3600 rpm brain. But after some

more thinking about his remark we were confronted with this question: "Is man no longer the master of all he creates?"

The machine tool industry builds many machines, which are similar to the I.B.M. machine. They are also equipped with electronic controls or "mechanical brains" which are designed to eliminate human failings. The industry has made tremendous progress in the last 20 years in the automatic control of handling and clamping; automatic control of a battery of machines or single units; faster speeds and feeds. These machines make some of the old models appear awkward and crude by comparison.

We would like you, the reader, to think about these robot-like machines as you wind your way through the hundreds of machine tools and accessories which will be on display at the three machine tool shows in Chicago, Sept. 6 to 17.

We think you may ask yourself the same question as we did after old "math genius" confessed his admiration of the mechanical brain. But in any event, we think you should make a point of attending the shows and get a first-hand glimpse of the Twentieth Century wonders of the mechanical age. We know we'll be there.

Victor G. Morris Assoc. Editor 1910 Our 45th Anniversary 1955

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### in the American tradition

Twice a day a quick transformation overtook the old frame garage on John R Street, Detroit. At seven in the morning, the doors swung open, a spindly car chugged out and the garage became a busy little workshop. Some time after dark, the car was driven back in and, for a few hours, the workshop was a garage again.

As a workshop, it had for us a very special significance—it was here that our Company came into being and set up the first local shop devoted

exclusively to making industrial diamond tools.

But, far more important, it was the first place in the whole mid-west where industry could find a complete stock of fine industrial diamonds, imported direct to Detroit, and superior to stocks previously available only in New York.

Such convenience is taken for granted nowadays and the mails deliver thousands of our diamond selections yearly, but, in those days, it was an innovation and so useful that in almost no time at all, the old frame garage (which had cost \$50.00) needed a 12-foot addition (which cost another \$50.00).

And, that was but the beginning. Today, our plants are the most modern in the industry and in the intervening 45 years our laboratories have pioneered many of the most significant innovations in diamond tool

technology, including Engineered Diamond Tools\*.

Thus, in the good American tradition, a far-seeing idea, planted in the humblest beginnings, blossomed into a business that became national and international. And, this year, as we celebrate our 45th anniversary, we salute all of the many friends who helped to bring about this accomplishment.

\*Engineered Diamond Tools are diamond tools engineered to the job and guaranteed to do it.

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33 West Street, Bloomfield, N. J.

WHEEL TRUEING TOOL COMPANY OF CALIFORNIA 5560 Alhambra Ave., Los Angeles 32, California

WHEEL TRUEING TOOL COMPANY OF CANADA, LTD. 575 Langlois Ave., Windsor, Ont.





Encircle No. 278 on Card, Opposite Page 65



### very truly!

### Letters to the Editor

Time Study

Would you please send reprints of the articles on Time Study by Mr. Nissley which have appeared in your publication Machine and Tool Blue Book since the December, 1954, issue.

I enjoy them very much, and use the reprints to assist foremen in their understanding of Time Study problems.

Gene Babcock Standards Supervisor The Challenge Machinery Co.

For the past months we have been collecting and saving your series of articles on Time Study by Harold R. Nissley and now that they are completed we find that part 9 which appeared in the April issue of Machine and Tool Blue Book is missing and we are wondering if you could furnish us with a copy in order to complete our file.

E. D. Jones Asst. Chief Engineer Republic Rubber Div. Lee Rubber & Tire Corp.

I have had what I consider the exceptional good fortune to read a few of the series of articles on Time Study prepared by Harold R. Nissley and appearing in your publication.

Now, may I please have reprints of all these articles?

F. W. Boyles, Engineer National Metal Products Co.

Have been following the Time Study articles by Mr. Harold R. Nissley with a great deal of interest and enjoyment.

In the December issue you mentioned putting the complete series in booklet form. If this is to be, I would like to be put on your mailing list. If the booklet is not to be printed, then is it still possible to receive a complete set of reprints . . .?

Henry Zelasko, Plant Supt. Champion DeArment Tool Co.

In the June, 1955, issue of Machine and Tool Blue Book, you completed a series of articles under the title of "Time Study" by Harold R. Nissley. Would it be possible to obtain reprints or tear sheets of this series?

We believe these articles would be of tremendous value as a permanent reference and guide in handling negotiations of this nature.

We would like to obtain five sets of this series.

C. G. Reavis, Works Manager Sterling Wheelbarrow Co., Inc.

### Carbide Tooling

If available, I would appreciate receiving tear sheets of the excellent article entitled, "Application and Grade Selection of Tungsten Carbide Tooling" by Mr. Edward J. Novack of Kennametal, Inc., Latrobe, Pa. which appeared in the June issue of your publication.

> Dan Profant, Engineer Research Branch The Carborundum Company

Tear sheets sent.

### **Press Reports**

... Needless to say, we have had many occasions to use the information which is currently supplied by your excellent BLUE BOOK publication which we receive regularly and read carefully.

We therefore appreciate it very much if you would send us the tear sheets of the press series comprising all the reports mentioned in our letter of March 17.

> Umbelino P. Martins Technical Director S. A. Armando Busseti Rio de Ianeiro

Tear sheets sent.

### Shop Hints

In the May issue . . . on page 26 under Shop Hints you showed a unique method of forming tubing.

Would it be possible to tell us how we might obtain more information on this method? Does anyone manufacture this type of die? What are the limitations on size, etc.?

> W. Harrold Johnson Plant Manager The Will-Burt Co.

The tube spacer forming die may be obtained from the Dayton Rogers Mfg. Co., Minneapolis, Minn.

### **Boring Bars**

We have need for a source of boring bars of the type in which a single point cutting tool is advanced out of the bar by a micrometer screw.

F. J. Gooffrey
President
Geoffrey Lane, Inc.
Information sent.

### Miniature Water Pumps

Could you please help me to locate the manufacturer of a small electric water pump? We are planning on building a model of Niagara Falls.

Timothy Ga Goudy Ga Goudy Miniatures Mfg. Co.

Information sent.

### **Visual Tachometers**

Could you send me information as to what concerns manufacture visual tachometers?

The device I have in mind has an eyepiece through which an individual can look at a rotating member, and by adjusting it until the member appears to stand still, he can read the RPM directly from a scale on the tachometer.

> Clyde W. O'Neill Ordnance Corp. Rock Island Arsenal

Information sent.

### Information Wanted

Would you please send me all the information that you have on the articles listed below.

How to Select the Proper SFPM in Milling Operations; and "Time Study," written by Harold Nissley.

Thomas Theiss
Estimator
Clearing Machine Corp.

Tear sheets have been sent on the article on "Milling Operations." The "Time Study" series consisted of eleven parts, the last of which appeared in June. We reprinted the first five parts and the demand was so great for these that our supply was quickly exhausted. However, the entire series will be published in booklet form shortly at an approximate cost of \$1.00. We shall be glad to add your name to our lengthy list.

### you'll see on equipment at the Chicago Shows





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### **Capital Approaching Fascism**

The Capital at this time is undergoing many changes, psychologically, socially, economically and politically. It is quite apparent to those of us who have been here constantly for a number of years that the old tempo of Government, and the idea of Government, is rapidly vanishing. As a nation and as a Government we are rapidly coming closer to something that is hard to describe except to liken it to a form of Fascism. And the term is not used invidiously. Administratively we are getting a corporate business Government with remarkable speed. What makes it unlike the preceding European Governments of the same broad, general tenor is that we have a Congress that still is, in spots, vigorously opposed to what is happening elsewhere.

On the other hand the general impression in Washington is that the states are more or less dominated by the Federal Government, and that the Federal Government is dominated by the Supreme Court. Both the Executive-Administrative part of the Government, and the Congress, try, but are not able to cope with the Supreme Court. It

- government administration is becoming a corporate business
- states and federal government are dominated by Supreme Court
- money from U. S. pours into foreign lands
- labor unions favor increased immigration
- new machine tool orders for Air Force, Navy
- milling and broaching machine contracts set stockpile program in motion
- 1955 machine tool shipments not expected to equal 1954

doesn't matter what regulations the Executive-Administrative, or the Congressional part of the Government may provide as orders or laws, the Supreme Court inevitably is the source of last resort, and by acting as interpreter can, and does, constantly change the intent of the laws and the orders that are supplied.

### Businessmen Unaware of Government Changes

The most curious thing to us here in Washington is what seems like a lack of understanding among many businessmen as to what is happening and what has happened to their Federal Government. They are aware of the machinations of the Communists. the Socialists and all the other Collectivists, and of the racial conflicts that are giving so much trouble and again breaking the country down into sections in their loyalties and emotions. But so many businessmen who come here apparently do not know, and do not care, what is happening to their great country and is changing its principles, its direction and its destiny. They are patriotic, but they do not seem to understand that more is needed than the protection of business interests. The fundamental meaning of the tremendous changes that have happened, and that are happening, so far seem to be largely unperceived.

### More Money for Foreign Countries

Meanwhile the tax money is flowing everywhere in volumes and for uses that seem incredible. The colossal sums that continue to go to Europe, to Asia, to Africa and wherever they may find lodgment, grow instead of diminish. The Foreign Operations Administration recently gave Egypt \$1,631,900 to buy machine tools anywhere it chose. About the same time, under the same condition, it gave Formosa \$260,000. Pakistan, with the privilege of world-wide procurement, was given \$120,000 for machine tools, and then India was handed \$375,000 under the same condition for the same purpose. It was at this time that India demanded that the Bureau of Foreign Commerce, U. S.

Department of Commerce, under India's second five-year plan, to begin in 1956, should help it to secure American capital to invest in the various projects it had under consideration, which included construction, jute, textiles, sugar, paper, cement and, of course, various machines and machinery undertakings. It seeks to expand its basic industries of ferroalloys, aluminum, copper, zinc and other nonferrous metals as well as various chemical projects. Investors interested should send for a pamphlet published by the Bureau of Foreign Commerce World Trade Information Service.

The Foreign Operations Administration bowed out July 1 after spending \$9 billion "to aid friendly countries" during the past twenty-three months. July 1 the new Agency, which took its place, came into existence under the name of the International Cooperation Administration. This is the fourth foreign aid agency in the series to carry out the Marshall Plan. John B. Hollister, Cincinnati lawyer, will be its head. Stassen goes to the White House as the grand almoner with far greater spending powers.

The Canadian Secretary of State recently urged that we Americans should provide the funds for some of the Asiatic countries without the mercenary desire either for profit or for return of our funds. He thinks it would be deplorable "if Asians believed that Westerners had insulted their dignity or misread their integrity, by entertaining such notions." He thought that Americans should, out of their abundance, help others who are less fortunate.

The Philippines have received \$26,000 to buy machine tools either in the United States or in possessions of





### CUTTING GRINDING TAPPING ROLLING

### **THREADS**



CUTTING



GRINDING



TAPPING



ROLLING



• The 8C LANDMACOone of five new Thread-Cutting machines to be demonstrated. These machines are designed for precision threading of workpieces from 3/16" to 6-5 8" in diameter. Above is the new 2" LANDMATIC -one of the many Standard and Special Thread-Cutting Heads on display designed for application to Automatics and Turret Lathes. The CENTERLESSThread

 The CENTERLESSThread Grinder—to be shown in operation—for infeed and thrufeed grinding of threads from 1/16" to 4" in diameter at mass production rates.

● The LL Collapsible Tap for producing internal tapered threads featuring detachable heads for wide range coverage. On display will be Rotary or Stationary Standard Taps for straight or tapered threads, Solid Adjustable Taps, and Taps for other special applications.

The new LANHYROL Thread Rolling Machine—shown in a variety of demonstrations — revolutionary in its output, accuracy, and flexibility. Above is the ≠20 LAN-ROLL Attachment—one of five sizes of Thread Rolling Attachments for Automatics and Turret Lathes to be displayed.

LANDIS Machine COMPANY . WAYNESBORD

the United States; and Nepal, a country of the original Indian group in Asia, which does not maintain a diplomatic officer in our country, but maintains its diplomatic liaison through London, received \$40,000 to buy machine tools wherever it might choose.

U. S. Trade with Canada in 1954 was higher than U. S. trade with the next four leading countries combined. Exports to Canada totaled \$2.8 billion, as compared with combined exports of \$2.5 billion to the United Kingdom, Japan, Mexico and Venezuela. Imports from Canada totaling \$2.4 billion, also exceeded total imports of \$2.2 billion from the next four leading sources—Brazil, Colombia, Venezuela and the United Kingdom.

### **Foreign Purchasing Agencies**

Well over 100 foreign governments have purchasing agencies in the United States and are listed in a newly revised bulletin available to U.S. businessmen who request a copy from the Department of Commerce: No. 55-74, Operations Report, Part 2, BFC's World Trade Information Service. If you wish up-to-date information on how to protect your industrial property rights abroad, that information is also available.

### **Belgium Presents Opportune Market**

The Department of Commerce emphasizes that Belgium offers a sound investment climate to U. S. businessmen seeking location for new ventures abroad. Belgium has a stable government, good social conditions, high standards of living, financial stability and comparatively little Government interference with business. Number 55-43, Economic Reports, Part 1 of the World Trade Information Service sup-

plies a summary of laws and regulations and other details, including information about business and personal taxes.

### **Relaxation of Immigration Restrictions**

We are to have a tariff deal with Ethiopia, including relaxation of the regulations admitting its nationals to the United States. The labor unions have urged both the President and the Congress to adopt the ten amendments which would make easier the admission of immigrants to the United States from every country of the world. Curiously enough this is consistent with the campaign of a newspaper publisher in Southern California who owns twelve dailies which stretch from the Pacific to the Mississippi River. He wants practically entire abolition of all immigration restrictions, and the admission of aliens regardless of race, creed, color or nationality.

### Air Force, Navy to Buy Machine Tools

Before the end of this year the Air Force schedule calls for contracts totaling \$84.6 million to be spent on orders to be placed for machine tools. In fiscal 1956 the Air Force program calls for the expenditure of \$100 million for machine tools to be placed in storage. It is understood these orders are to be made available not later than April, May and June, 1956. Thereafter the program is to run along at the rate of \$100 million a year until the total sum of \$500 million is used up. These orders are tied up with Wright Field.

At the same time the Navy will spend \$14.6 million on machine tools during the earlier period, and it is planned that there will be a program for the expenditure of \$400,000 on radio grilles.

### Machine Tool Stock Pile Program Begins

During the current fiscal year four companies received contract awards totaling \$11 million for milling and broaching machines, which inaugurated the program to stockpile \$100 million worth of long-lead-time machine tools during the current fiscal year. It is estimated this program, totaling over \$500 million, will stockpile machine tools and expedite war production by at least a year after the start of any future war.

### **Machine Tool Shipments Down**

A BDSA mid-year industry report scheduled as of July 5, 1955, states that machine tool shipments during the last six months of the calendar year of 1955 would approximate \$280 million. These with the estimated \$390 million worth of machine tools shipped during the first half of 1955, will total an estimated \$670 million for the twelve months of the year. In 1954 the shipments for the twelve months were slightly in excess of \$1 billion.

### Lack of Machine Tools Cited by Russia

Russia has complained loudly that its vital machine tool industry is having hard going. Those in charge of its needs ominously have emphasized that its Ministry of Machine Tools has been able to produce only large quantities of out-of-date tools and other machines. The statement made much of the fact that the machine tools produced by the Soviet people were far below the modern standard of world production. The fact was repeatedly hammered into the consciousness of the Russians that they lack machines and equipment specially

designed for manufacturing arms, ammunition and implements of war; jig boring machines; contour profile grinders; jig grinders; lap radial grinders; thread grinding machines; spar millers; armor plate planers; military-type jigs.

They said they need larger sizes or more advanced or specialized types of the following: vertical boring and turning mills; deep hole drilling machines and drills; internal cylindrical, surface, and roll grinding machines; grinders for broaching machines; turret lathes; automatic lathes; combination tubeboring and turning lathes; engine lathes; thread milling machine, combination millers and planers, forging hammers; presses; wire, tubing and strip machinery; machines for plate working, metal cutting, broaching, gear making, honing and lapping, profiling and duplicating.

### **Defense Appropriations**

The Armed Services Defense appropriation totals \$32,232,815,000. It consists of various items including \$7,573,980,000 to be spent by the Army; \$9,180,157,000 for disbursal by the Navy; and \$14,783,678,000 to be spent by the Air Force. Obviously these items contain various products which will require more machine tools. The appropriations bill and the report which accompanies HR 6042, does not give any details how the funds are to be spent.

The Hoover Commission has strongly opposed some sections of the bill, especially those which provided funds to operate almost 3000 different kinds of businesses that should be solely under the control of private individuals.

The End



### GUIDE PIN

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### Here is the Hole Difference

Inside diameters are the hole difference between Lamina Bronze Plated guide pin bushings and ordinary guide pin bushings . . . the difference between costly downtime and continuous, trouble-free press operation.

The secret of Lamina Bronze Plated bushings' outstanding ability to stay on the job is a process\* of precision electroplating the exact amount of copper and tin (both are lubricants for steel pins) on hardened steel bushings, wherein the bronze plate becomes an integral part of the steel backing. This ideal combination provides strength along with smooth, free-running action for long-wearing, dependable service. Distortion, seizing and scoring are eliminated.

If you have dies in your plant equipped with ordinary bushings, you know the headaches that occur. Now, you can do away with press downtime due to bushing failures. You can reduce part rejects and maintenance costs, increase

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### THIS COMBINATION WILL PRODUCE RESULTS.

Boring heads from 1½ to 7 inch diameter. Boring tools, carbide or high speed steel, ½ to 1¾ inches diameter. Bore holes from ½ to 20 inch diameter.

Accuracy for the closest tolerance • Rigidity for the heavy cuts • Heat-treated parts for long wear

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"Results were startling"—"Able to speed up production" with



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OLSEN machine & tool inc.

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The Felters Company Boston, Mass.

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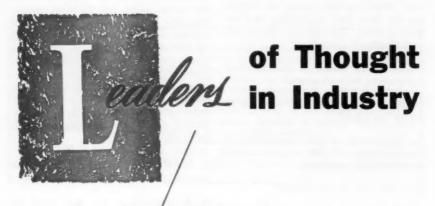
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Be sure to see this Brand new model 2B-36 De Vlieg Spiramatic Jigmil which will be introduced at The Machine Tool Showlat Chicago-Dee This new machine "JIGLESS BORING" parts under production conditions of the De Vlieg Exhibit, Booth 1317, 2B-36 DE VLIEG MACHINE CO. 450 FAIR AVE., FERNDALE . DETROIT 20, MICH.



An Interview with

### Milburn A. Hollengreen, president, National Machine Tool Builders' Association and president of Landis Tool Company

Q. In what respect will the machine tools, to be shown in Chicago during September, be superior to, or different from, present tools?

A. You'll see a lot of automated equipment, much more than you can imagine. This will be of the well-known transfer type and of the special machine type.

In the standard tools a great deal of development work has been done by the builders. The majority of machines were designed to take the manual operation out of machining.

There'll be machines with pre-selection, automatic clutches, automatic shifts; in fact, wherever an automatic device could be used to perform the machining function it is designed into the machine to eliminate, or reduce to a minimum, operator participation. New tools will be easier to operate.

I don't mean to imply that the operator will be completely eliminated, but merely that much of his work will be done for him by the new machine tools. The prime goal of the builders has been to reduce the cost of producing a given piece, either by reducing the actual cost or by so increasing the output at no increase of cost that a final reduction of cost is possible.

Of particular interest at the show will be a new type of tool. This will be a cross between a standard machine and a special. It consists of a standard machine which the manufacturer transforms into a special by hooking up a unit which contains means of conveying the parts, loading, cycling, and unloading them. The unit can also be had with feedback control.

There is a future in this kind of equipment. It bears watching.

Q. How many visitors are expected to attend the show?

A. We expect a gate attendance of approximately 200,000 engineers and metalworking executives.

Q. Is this for all the shows?

A. No, I'm speaking only of the Amphitheatre, where the machine tools will be shown. However, those who attend the Amphitheatre exhibits will also go to the Navy Pier for the accessories. At the 1947 show we had a gate attendance of 170,000 visitors.

There will be thousands of overseas visitors. It is difficult to say exactly how many will come from overseas because many of the arrangements for their transportation and their stay here are being handled by the dealer organizations.

We expect a huge contingent from Washington. All of the military branches are sending their important people, in some instances of from 20 to 30 men from each branch.

The dealer organizations are contacting congressmen and senators and are personally inviting them to attend. Many have already expressed a desire to come.

Q. Have you any idea of the cost of the show?

A. At the Amphitheatre you will see machines totalling \$20 million, that's the actual value. In addition, manufacturers are spending another \$10 million for the cost of participating, including transportation, housing, salaries, costs of displays, cost of labor, promotion, etc. As you know, the National Machine Tool Builders Association also backed the expansion program of the International Amphitheatre to assure exhibitors enough room for their displays.

Q. What is the climate in Washington regarding the machine tool industry?

A. A tremendous job was done in educating the government to the role of machine tools in our economy. Only a short time ago only a few in Washington knew what a machine was or why. The builders had to start from scratch and do first and educational job before the more complex aspects of the industry could be discussed. It i strue, at one time, not so long ago either, many people in Washington dismissed machine tools as being of no particular importance. This, happily, has been changed.

Today machine tools figure in the planning. It is realized that plans are useless unless provisions are made for production, and machine tools are the backbone of production. This thought is finally getting into top places.

The machine tool industry is a small industry. We have few votes. We can exert no pressure compared to some of the large organizations who control millions of votes. All of our contacts were made by the builders themselves.



Milburn A. Hollengreen

Milburn Alfred Hollengreen, president of the National Machine Tool Builders, Association, is also president and general manager of the Landis Tool Co., and Gardner Machine Co. He was born at Renovo, Pa., and received his formal education at Cornell University, graduating with a mechanical engineering degree in 1926. During the same year he joined Landis Machine Co., as assistant chief engineer. In 1936 he left Landis Machine Co., to become assistant general manager of Landis Tool Co., and subsequently rose to his present position.

Mr. Hollengreen served as Chairman of Government Relations Committee, National Machine Tool Builders' Association from 1948 to 1953. In 1955 he was named president of N.M.T.B.A.

The men of the industry went to Washington and tried to put their ideas across. The builders do not have a lobby, and I rather think the people in Washington appreciated the fact that no pressure was put to bear but that men of the industry would talk to them plainly and simply in terms of the country's needs. The distributors have also been of great help in Washington.

Q. If machine tools are to be considered an investment, are there any percentage figures which might give management an idea of what per cent return he can expect from his investment?

A. That varies greatly on the industry and the operations to be performed. The automotive industries want to amortize in two to five years. Sometimes the percentage of return runs as high as 40 to 50%.

You know, a man will invest money in somebody else's company and realize a return of 5 per cent, but he will not invest in machine tools for his own company and realize a much larger return. There is no better investment than a man's own plant in which he controls the investment from beginning to end; instead he puts his money in the other fellow's plant, has no control over his investment, and is happy with five percent.

Q. Do you think automation will cut heavily into standard machine tool operations?

A. Standard machines will still provide the basic operations. The new standard machines will be faster, more accurate; wherever possible, the manual element of operation will be removed.

Q. Where in your estimation lies the greatest area of cost reduction for the manufacturer?

A. The new factor in manufacturing is labor time. In the past it used to be Manufacturing, Engineering, Sales; now it is Manufacturing, Engineering, Sales and Labor Problems. Formerly industry laid greatest emphasis on pieces per hour and high accuracy; today the desire is to reduce labor time.

Developments point toward machines which will do the work of several, thus reducing labor time.

Q. Has the recent depreciation law helped the builder? the user?

A. The law will help the builder. It will help the user who, unfortunately, does not yet fully comprehend what it will do. He must be taught the advantages of the new law. But I do think

it will help him.

Even so, the tax law is not what it should be. It just doesn't go far enough. Why shouldn't a manufacturer write off his equipment in five years or less if he wants to? To be sure, the Treasury Department will lose a small amount of money in taxes for a while but it will more than make up for the loss by the return on higher production and higher output. The Treasury Department can only win. Industry will gain.

Q. Is the machine tool industry better prepared for war than it was in 1950?

A. No! Considering the population increase of our country and its industrial growth and needs our job will be bigger than it was before; added to this is one important point: we'll not have time to mobilize as we did in 1941 and 1950. We must be ready. I'm afraid industry is not ready.

Q. Are there plans under way to remedy this situation?

A. Plans, plans, plans! The machine tool builders have advanced any number of plans but little is being done to implement any of them. The best answer is to make it possible for American industry to be prepared at all times. This means that machine tools should be readily purchased and depreciated quickly. Our plants must be ready at a moment's notice; this can be done

by making certain the plants themselves are efficient and have new equipment. This does not mean that the machine tool builders want a subsidy to build tools and place them in plants . . . rather, make it possible for plants to be able to buy the tools currently. In this manner, should a war break out American industry will be modern, up to date, and fully equipped to produce war materiel in a hurry.

The government must make it possible for a plant to modernize and maintain its equipment in top operating condition. The machine tool industry believes this is best done by making it worthwhile for a plant to buy new machines rather than to hold on to the old. Today, under present tax laws, it is easiest not to modernize! From a long-range point of view, of course, this is industrial suicide. From a national viewpoint, it can spell the difference between success and failure, between victory and defeat in the event of hostilities.



"I suppose this means a black mark against me."



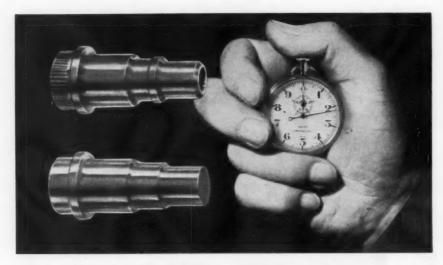
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It's the largest and most important show of its kind; one you can't afford to miss. The last time it was held, in 1947, all attendance records were broken—and this time even greater crowds are expected. The Production Engineering Show, being held on the Navy Pier, in Chicago, on the same dates, offers a bonus attraction that's hard to beat; a chance to see the latest in machine tool accessories at no additional cost. The same badge will admit you to both shows.

Bring your key production people to Chicago in September; share with them this unequaled opportunity to see the latest developments in machine tools. The 1955 Machine Tool Show is the best chance you've ever had to see the world's best investment—in action!

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By the time the B-1113 piece was finished, you'd be halfway through a second Ledloy piece. Such greater speeds and feeds are possible with Ledloy because Ledloy contains a built-in lubricant which substantially reduces the friction between the steel and the cutting tool.

That built-in lubricant is lead—so finely dispersed through this free-machining, open-hearth steel that you can't see it with a microscope. The addition of this small percentage (.15-.35) of lead has no effect on the mechanical properties of the steel EXCEPT to greatly increase machinability.

Ryerson Ledloy machines up to 50% faster than B-1113...tool life is extended as much as 200%... and net savings of 25% and more are effected. And Ledloy machines to an unusually clean, smooth finish—case hardens effectively—and bends, crimps, swedges or rivets easily. Ask your Ryerson representative for the facts about Ledloy or write us direct for engineering data. Ryerson was the first to stock Ledloy and today your nearby Ryerson plant carries the world's largest stocks of Ledloy rounds, squares and hexagons in a wide range of sizes for immediate shipment when you call.

Principal Products: Bars, Structurals, Plates,
Sheets, Tubing, Alloy Steel, Stainless, Etc. RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N.C. CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

### **New Profits Through Depreciation**

by Victor G. Morris, Associate Editor

DEPRECIATION as defined by Webster's dictionary is thus: "Decline in value of an asset due to such causes as wear and tear, the action of the elements, obsolescence and inadequacy." This in effect means an annual charge to cover the decline in value of an asset, usually in the form of a percentage, fixed in advance, of the cost of the property depreciated.

It is obvious now that depreciation is an arbitrary figure based on the overall current financial investment figure of the depreciator. Small depreciation figures are favored by most companies because it enables them to show greater annual earnings. They are also favored by the government because it means higher annual tax returns based on the higher corporate profits.

Obsolescence, according to Webster, is "the depreciation of existing machinery or plant due to the invention of new and better processes or machinery." In actuality this means that obsolescence is measurable in dollars and cents in terms of declining efficiency, reduced productivity of ma-

chines and manpower by comparison with newer developments.

The average period of use before obsolescence of machine tools is approximately seven to ten years.

### **Obsolescence Disregarded**

If the practice of depreciating production equipment, such as machine tools, is approximately 5% of the original cost per year, while the average economically productive life of that tool, before becoming obsolete, is used up at the rate of 14-2/7% to 10% per year, it is apparent that the obsolescence factor is either disregarded or de-emphasized to the point of being negligible. This is fallacious thinking, because the true interpretation of the definition of depreciation is not separate from, or incompatible with, obsolescence. Rather the opposite is true, because by definition, depreciation charges are meant to cover the normal decline in value of an asset, regardless of the source or reason for that decline, and obsolescence is the actual reason for asset value de-

Let's take the case of a company's

operation and see how long term depreciation can affect it without consideration of tool obsolescence.

The company consists chiefly of metalworking and the major share of its equipment involves machine tools. At the end of seven years of successful operation, the nature of the company's business begins to change. Old customers begin to fade out. New customers enter the picture with different work requirements.

Now the company is faced with new operation problems. A production engineer points out that \$100,000 in new machine tools should be purchased to handle new production on a low operating cost basis.

However, financial executives argue that the old machine tools scheduled for replacement have been depreciated at the rate of only five per cent a year, and are supposed to be good for 20 years (according to U. S. Treasury law). Records show that the equipment originally cost \$80,000 and that the tools remain on the company's book at \$52,000. Actual market value is about \$20,000 or \$32,000 less than the company's book value.

In a profit year, loss on the sale of old equipment could be deducted from earnings as an expense. But the financial men insist that this loss plus purchase of new tools is a \$132,000 transaction. The result is that the company turned down the request for new machine tools, and no longer makes the same profit. The company was forced to use depreciation reserves to continue dividends because operations were not charged with sufficient depreciation.

Several years later, the nature of the firm's business again changed. This

time the new machine tool equipment was essential. But the company had no choice this time as all depreciation reserves had been eaten up through dividend payments.

Efforts to borrow money failed because the company's equipment was too old to justify a loan. The company, unable to raise new capital, went into voluntary bankruptcy.

It is surprising to learn that 59% of privately owned machine tools are 10 or more years old.

Getting back to what actually happened to the company which was forced into bankruptcy, we find the chief reason for its failure was due to the basic difference in thinking within the company.

The operating heads thought in terms of obsolescence while their financial men thought in terms of depreciation.

### **Plant Efficiency Prime Aim**

The prime aim of the operating men was plant efficiency in terms of wage rates and output per man hour. Increasing productivity of personnel was their major goal. Rising production costs to the operating men suggested the specter of declining productivity of the plant, inefficient use of man power.

However, the financial men didn't know whether a particular machine was obsolete, but they did know the annual recovery rate of the purchase price of the machine. And they considered this factor, not in terms of performance of the machine, but in terms of the over-all current financial picture of the company.

This difference in thinking within a company can be eliminated some-

what by developing a better understanding by these men of the part modern design and methods play in the cost of production—and the part cost of production plays in determining selling prices and in turn volume of sales and annual earnings. Such an understanding should be sought bearing in mind the long range aspect of the company's financial success and stability in a highly competitive age.

A balance can be achieved if the work factor, wear factor, and obsolescence factor are considered in the life of each machine.

### The Work Factor

In terms of the work factor, the life of a machine tool is a long one. For as long as it runs, a machine is considered productive. When it breaks down, it can be repaired and returned to operation. That is the basis on which most industries depreciate their machine tools—the underlying theory of the 5% depreciation principle. During the Korean war many companies had their machines working on a threeshift, 24-hours a day for three years or more. Many of these machines are still performing at an accelerated production rate. As a result the life of the machine may have shortened by as much as six years. Such machines should be subjected to a complete reexamination of depreciation schedules.

### The Wear Factor

Businessmen sometimes forget the wear factor is ever-present. The wear factor is governed by important factors:

1. the job each machine is called to perform. Hard, tough metals, heavy parts, abnormally high, sustained cutting speeds, over loading will step up rate of wear, shorten efficient life of

a machine. 2. the operator who runs a machine. If he is careless, neglectful, insufficiently experienced or trained, his machine will show the effects. 3. the maintenance a machine receives. If lubrication, vibration, alignment, dirt and grime are neglected, the operation of the machine will be quickly impaired. Therefore, the wear factor deserves close attention in setting up depreciation of a machine. It can actually raise the depreciation rate of a machine to as high as 10%.

### **Obsolescence Factor**

Obsolescence is the measure of the productivity of a machine, the factor which raises the cost of operating a machine until it becomes uneconomical for a company to continue doing so. It is an elusive figure, completely governed by the comparative productivity of newly-perfected machines which have been designed to do the same job faster, more efficiently, more cheaply. For example, the stepped up development of machine tools during the war years has already made many comparatively new machine tools obsolete. Management must recognize this fact and prepare for it. In normal times, the obsolescence factor of machine tools should be considered at approximately 12% when setting up a sound and conservative depreciation schedule.

Almost without exception every plant in the nation is faced with a "cost of production" problem. An integral part of which is the machine tool problem: (1) old tools which are patched up, causing inefficiency, wasteful man-power and scrap; (2) machine tools purchased between 1935 and 1945 have been rendered obsolete by the increased tempo of Korean wartime tool develop-

ment; (3) machine tools purchased new in 1942 have been driven hard for almost 13 years on three shifts at the rate of 24-hours a day. Actually they are now carrying the burden of about 25 years normal work and wear. In terms of new development, they have in a great many instances reached the obsolete stage. Yet, many of those machines will still be in operation in 1962 if they are depreciated off over a 20-year program.

It is a major weakness of the industry of the U.S. that the financial side of management is reluctant to accept obsolescence as an operating actuality. Common sense tells us it is wasteful to drive and maintain a 1935 automobile with its uncertain operation, high cost of upkeep and uncomfortable riding qualities. An efficient, modern car will take you where you want to go with comfort, safety and speed - for one quarter of the cost. Yet, today, operating departments of scores of plants are burdened with 20-year-old machine tools, which by comparison with new models, show operating losses instead of profits.

The internal revenue men cannot be expected to know metal-working operations, so they base their depreciation schedule rulings on the continuing use of the machine. However, now that the tax men have partially recognized acceleration of depreciation and have given the taxpayer at least some range of option as to rate write-off, machine tool customers have less reason to force their battered old klunkers to compete with new, automatic, efficient machinery.

### **Accelerated Depreciation**

The permitted degree of acceleration is less, and options lie in a smaller range than it is hoped may eventually be allowed. It is of vital significance, however, that the option principle has now been written into the nation's tax structure.

The chief optional provisions under which a company may, if it chooses to do so, write-off machine tools at a faster rate than the straight-line method are the following:

- 1. The double declining balance method, under which a company can write off about two-thirds of the original cost in the first half of the machine's tax life;
- The sum of the digits method, under which a company can write off about three-fourths of the original cost in the first half of the machine's tax life.

From the standpoint of investment of capital this is a step in the right direction, for it means that a company purchasing a new machine tool can recover a larger part of its cost during the period of reasonably foreseeable risk, and the period of profitable life of the machine.

The new law will unquestionably stimulate many companies to refigure arithmetic with respect to contemplated replacement programs.

### **Double Declining Depreciation**

The new tax code (section 167) authorizes the use of the declining balance method of depreciation at double the straight-line rate. This

means that a taxpayer acquiring a \$10,000 machine with a tax life of 20 years will be able to write off 10% (twice the straight-line rate of 5%) in the first year, 10% of the undepreciated \$9,000 in the second year, 10% of the then undepreciated balance of the \$8,100 in the third year and etc., etc.

Double declining depreciation leads to a write-off roughly two-thirds of the original cost in the first half of a machine's tax life. Then in the second half, the annual deduction fall off sharply, and a substantial balance remains at the end of the 20th year. In the case of a \$10,000 machine this amounts to \$1,216 or roughly the cash value of the machine on the used machinery market.

### Sum of the Digits

Section 167 also authorizes depreciation according to the sum of digits, a method first suggested to the Senate Finance Committee by R. W. Banfield, as Chairman of the National Machine Tool Builders' Association's Committee on Tax Policy. Under this method, each annual depreciation charge is a fraction of the original cost, the numerator of which is the "reverse year" of the machine's life and the denominator is the "sum of the digits." In the case of the first year's depreciation charge on a 20-year machine, costing \$10,000, the reverse year is 20, for the second year 19, for the third 18, etc. The "sum of the digits" is 210 (1 2 3 etc. up to and including 20 equals 210) the first year's charge would therefore be 20 x \$10,000 or \$952. The "reverse year" of the second year is 19, but the "sum of the digits" is still 210 and the second year's charge would therefore be  $\frac{19 \times \$10,000}{210}$  or \$905. The third year's charge would be  $\frac{18 \times \$10,000}{210}$  etc., etc.

The "sum of the digits" provides slightly smaller depreciation deductions than the "double declining balance" method during the first two years of a machine's life. But the "sum of the digits" catches up in the third year, and over the first half of service life it permits the write-off of almost three-quarters of the original cost as compared with the two-thirds allowable under "double declining balance." It also has the advantage of providing a full write-off over whatever estimated life is adopted.

Now is the time to take advantage of present business conditions—and reorganize depreciation schedules with an eye on obsolescence. It may well mean a stronger competitive position when low prices and low costs are the sole market factors.

The End



# 1955 Machine Tool Show Will Unveil Many New Techniques and Developments

THE MACHINE tool and accessories industries will unveil many surprises on September 6 at the three industrial shows at Chicago. This will be the largest industrial exposition ever attempted and will feature new and wonderful automatic equipment which will accentuate a two-fold purpose—decrease cost and increase production.

The machine tool designers have put to full use their ingenuity and skills to produce machines that will make the war-born models appear crude and awkward by comparison. It is with a great deal of pride that the machine tool builders and their related accessory industry brothers have assembled at Chicago with a show that promises to stagger the imagination of the common man in industrial equipment. More than 200,000 business executives from all parts of the world are expected to flow into Chicago by train, car, plane, bus and ship to participate in this 20th Century march of industrial science.

### **Helicopter Service**

The machine tool planners have left

INTERNATIONAL AMPHITHEATRE, showing \$2 million Exposition Hall completed October. 1954. The new structure adds 188,000 square feet of floor space for a total of 450,000 square feet of clear exhibit space. A railroad track into the building and a truck dock for ten units speed loading and unloading. Trucks may be driven anywhere on the floor. All automobile parking areas adjacent to the building are now hard surfaced.



no stones unturned to make this the most successful of shows. Each and every visitor will receive the treatment accorded royalty. A scheduled helicopter passenger service, the first of its kind arranged for exposition visitors, will whisk businessmen over Chicago's traffic congested streets in a shuttle service between the Machine Tool Show at the International Amphitheatre and the Production Engineering Show at Navy Pier. Fleets of buses also will operate between Loop hotels and the three shows, including the Coliseum Exposition.

The Machine Tool Show, the largest industrial exposition in the U.S., is sponsored by the National Machine Tool Builders Association and managed by Clapp and Poliak, Inc., New York exposition firm, which also is producing the Production Engineering Show.

The Production Engineering Show is making its debut and will be devoted

to automation and automatic processes. More than 175 companies have already leased exhibit space and the total is expected to run more than 250.

### **Show Hours Coordinated**

Hours of all three shows have been coordinated to permit visitors to make maximum use of their time. The Machine Tool Show will be open from 10 a.m. to 5:30 p.m., while the Production Engineering Show operates from 1 to 10 p.m.

Equipment to be shown at the Production Engineering show falls into eight major categories:

1. Monitoring equipment; recorders and controls; electronic devices; switches, relays and electrical components.

2. Governing equipment: devices for tramp iron removal; x-ray, fluoroscope, and photocell devices; limit switches and governors.

3. Special production equipment:

NAVY PIER, which juts out into Lake Michigan, will be the home of the Production Engineering Show where an estimated 250 exhibitors will display automatic and automation processes. A helicopter service will shuttle visitors between the shows at Navy Pier and the International Amphitheatre.



continuous heat treating and drying furnaces and ovens; abrasive, blasting and other finishing equipment; engineered paint systems, weighing and proportioning equipment.

4. Equipment components: air and hydraulic mechanisms, mechanical activators; brakes, clutches and drive mechanisms; electrical, air and hydraulic motors.

5. Handling equipment: conveyors; cranes; hoists; monorails; pneumatic tubes; clamping, rotating and positioning equipment; loading and unloading

equipment.

6. Communications equipment: Two-way radio; telephone and paging systems; teleprinters and facsimile.

7. Inspection and gaging equipment: air gages; strain gages; beta ray thickness gages; x-ray gages; optical gaging equipment.

8. Machine tool accessories: bearings, cutting tools, coolants, chucks, dies, jigs, lubrication systems, portable tools, pow-

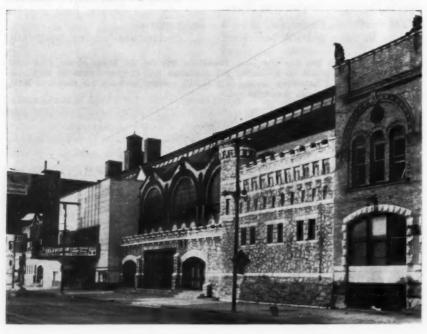
er transmission equipment.

Eight universities will make an unprecedented joint presentation of their latest research to industrial executives at the Production Engineering Show.

The universities' exhibits will display results in both pure and applied research in the physical sciences.

The End

CHICAGO COLISEUM, located in the heart of downtown Chicago, will be the site of the Metalworking Machinery & Equipment Exposition. It is here that manufacturers of accessories and attachments for the metal working industry and foreign machine manufacturers will exhibit their products.



# Chicago District Motel Directory

This list of motels with route numbers, locations, mileage from Chicago's downtown loop, and number of motel units, is intended as an aid to motorists attending the Machine Tool Shows (see accompanying map).

- 1—Lystlund's Resort—Route 21 and 83 Antioch, Ill. 55 Mi. N.W. of Chicago
- 2—Murrie's Motel—13U— U. S. 41 and State 173— Rt. 1, Box 201A, Zion, Ill. 50 Mi. N. of Chicago
- 3—Rosecrans Motel—13U— Zion Hwy. 41 and 173 Zion, Ill. 50 Mi. N. of Chicago
- 4—De Young's Court—6U
  Winthrop Harbour, Ill. 50 Mi. N. of
  Chicago
- 5—Sheridan Lodge—6U—U.S. 42 Zion, Ill. 50 Mi. N. of Chicago
- 6—Du Bell Modern Motel—14U— Hwy. 12 & Nippersink Dr. Fox Lake, Ill. 50 Mi. N.W. of Chicago
- Fox Lake, Ill. 50 Mi. N.W. of Chicago 7—Arnold's Motel—17U— U.S. 12-114 Mi. S.
- Fox Lake, Ill. 50 Mi. N.W. of Chicago 8—Lagoon Motel—10U—U.S. 12
- 9—El Rancho Motel—10U—U.S. 41 & State 63
  - Waukegan, Ill. 45 Mi. N. of Chicago

Fox Lake, Ill. 50 Mi. N.W. of Chicago

- 10—Gee's Cabin Courts—16U— U.S. 41 & State 63 Waukegan, Ill. 45 Mi. N. of Chicago
- 11—Clausen's Court—8U—7 Mi. N. of Waukegan on U.S. 42 Winthrop Harbour, Ill. 45 Mi. N. of Chicago
- 12—Winthrop Motel—9U— 7 Mi. N. of Waukegan on U.S. 42 Winthrop Harbour, Ill. 45 Mi. N. of Chicago

- 13—Slumberland Motel—9U— 2 Mi. W. on Hwy. 120 Between Hwy. 131 & U.S. 41 Waukegan, Ill. 45 Mi. N. of Chicago
- 14—Doe's Motel—14U— U.S. 24 & State 100 Libertyville, Ill. 40 Mi. N.W. of Chicago
- 15—Tafel's Motel—12U— State Hwy. 31 at Carey Rd. Algonquin, Ill. 35 Mi. N.W. of Chicago
- 16—Wheeling Motel—9U— on Hwy. 21 and U.S. 45 Wheeling, Ill. 25 Mi. N.W. of Chicago
- 17—Clearview Motel—Route 21 and 45
  Wheeling, Ill. 25 Mi. N.W. of Chicago
- 18—Ren-Dell Motel—Route 21 and 45 Wineeling, Ill. 25 Mi. N.W. of Chicago
- 19—Palatine Ridge Motel—10U— U.S. 14 & State 53 Palatine, Ill. 20 Mi. N.W. of Chicago
- 20—Colonial Lodge Motel—14U— U.S. 20 East edge of city Elgin, Ill. 30 Mi. N.W. of Chicago
- 21—Joel Motel—11U— U.S. 20 and 59, 4 Mi, E. of Elgin, Ill. 30 Mi. N.W. of Chicago
- 22—The Keyes Motel—18U— U.S. 12 in town. Arlington Heights, Ill. 18 Mi. N.W. of Chicago
- 23—Rand Manor Motel—20U—N. edge on U.S. 12, 2 blks. N.W. of Jct, 12 & 45. Des Plaines, Ill. 18 Mi. N.W. of Chicago

24—Landmeier's Beauty Rest Motel—12U— Corner State 83 & Landmeier Rd. ½ ML S. of Route 72.

Arlington Heights, Ill. 18 Mi. N.W. of Chicago

25—Ranch House Motel—20U— State 62, 1 block N. of Touhy Ave. (Algonquin Rd.) Park Ridge, Ill. 16 Mi. N.W. of

Park Ridge, Ill. 16 Mi. N.W. of Chicago

26—Lasche Motel—20U—Hwy. 64 near St. Charles.
St. Charles, Ill. 30 Mi, W. of Chicago

27—Du Wayne Motel—30U— Route 64, 2½ Mi. E. of Route 59 West Chicago, Ill. 28 Mi. W. of Chicago

28—Jennie Peterson Motel—Route 64 West Chicago, Ill. 28 Mi. W. of Chicago

29—Bailey's Motel—12U— 1 Mi. W. of Addison, Ill. on Route 20. Elmhurst, Ill. 18 Mi. W. of Chicago

30—Holiday Motel—9U—U.S. 20 just W. of Route 83 Elmhurst, Ill. 18 Mi. W. of Chicago

31-Arcadia Motel-18U-U.S. 20 & 83

Elmhurst, Ill. 18 Mi. W. of Chicago 32—Traveler's Rest Tourist Court—14U— U.S. 20, ¼ Mi. E. of 83. Elmhurst, Ill. 18 Mi. W. of Chicago

33—West Wind Motel—Alt. 30, 3 Mi. W. of Wheaton West Chicago, Ill. 28 Mi. W. of Chicago

34—TV Motel—Alt. 30 & Meyers Rd.
Lombard, Ill. 20 Mi. W. of Chicago

35—Daniel's Auto Court—12U—U.S. 30 Aurora, Ill. 30 Mi. S.W. of Chicago

36—Hansen's Motor Court—26U— U.S. 30 S. Edge Aurora, Ill. 30 Mi. S.W. of Chicago

37—Metzger's A-1 Cabins—13U— New York St. on Rt. 65 Aurora, Ill. 30 Mi. S.W. of Chicago

38—The Curve Motel—8U— U.S. 34, 7 Mi, E. of Aurora Naperville, Ill. 25 Mi. W. of Chicago

39—Naperville Motel—Route 34, Ogden Ave.

Naperville, Ill. 25 Mi. W. of Chicago 40—Greentree Motel—Route 34, Ogden Ave.

Naperville, Ill. 25 Mi. W. of Chicago

41—L A Motel—U.S. 34

Downers Grove, Ill. 23 Mi. W. of Chicago

42—Friendly Motel—6U— U.S. 34

Brookfield, Ill. 16 Mi. W. of Chicago
43—Peterson's Royal Motel—11U— U.S. 34

43—Peterson's Royal Motel—11U— U.S. 34 Brookfield, Ill. 16 Mi. W. of Chicago

44—LaGrange Motor Hotel—18U— Hwy. 45-12 & 20

LaGrange, Ill. 15 Mi. W. of Chicago 45—Wishing Well Court—10U—

Route 66. ½ W. of 12 & 20-45 LaGrange, Ill. 15 Mi. W. of Chicago

46—Blackhawk Motor Court—10U— Rt. 66 at Wolf Rd.

LaGrange, Ill. 15 Mi. W. of Chicago 47—Casa Blanca—10U—U.S. 66, ½ Mi. W. of Jct. 66 with U.S. 12, 20 & 45 LaGrange, Ill. 15 Mi. W. of Chicago

48—Redwood Lodge Motor Court—U.S. 66, 1 blk. W. of Jct. with 12, 20 & 45 LaGrange, Ill. 15 Mi. W. of Chicago

49—Sleepy Hollow Motel—13U— U.S. 30, 5½ Mi. N.W.

Joliet, Ill. 50 Mi. S.W. of Chicago 50—Manor Motel—40U— U.S. 6 & 66 at over-pass Joliet, Ill. 50 Mi. S.W. of Chicago

51—The Vista Motel—10U— U.S. 6 at Jct. 6 6 7

Orland Park, Ill. 25 Mi. S.W. of Chicago

52—Don's Motel—10U— U.S. 6 & 45 Orland Park, Ill, 25 Mi. S.W. of Chicago

53—Virginia Motor Court—28U— U.S. 6 & 45 Orland Park, Ill. 25 Mi. S.W. of Chicago

54—Hi-Way Motel—9U— U.S. 6, 3 Mi. W. of Jct. State 1
Harvey, Ill. 20 Mi. S. of Chicago

55—Bel-Aire Motel—11U— U.S. 6, 1 blk. W. of State 1 Harvey, Ill. 20 Mi, S. of Chicago

56—Chicago Motel—8U— U.S. 6 in South Holland

Harvey, Ill. 20 Mi. S. of Chicago 57—Dutch Mill Motel—7U—U.S. 6 & Alt. 30 Lansing, Ill. 23 Mi. S. of Chicago

58—Lan-Oak Motel—9U— U.S. 6 & Alt. 30 Lansing, Ill. 23 Mi. S. of Chicago

59—The Brant Motel—21U—U.S. 41, ½ Mi. S. of U.S. 6 Highland, Indiana 27 Mi. S.E. of Chicago 60—Bob's Deluxe Motel—38U—U.S. 41, 5 Miles S.E. of Hammond ½ Mi. S. of Jct. 6 & 41

Highland, Ind. 26 Mi. to Chicago 61—Mecca Motel—6U— U.S. 41, ¼ Mi. S.

Munster, Ind. 28 Mi. S.E. of Chicago 62—Midwest Motel—11U—U.S. 41, ¼ Mi.

S. of U.S. 6 Munster, Ind. 28 Mi. S.E. of Chicago 63—Covert Motel—S. edge on U.S. 54 Matteson, Ill. 30 Mi. S. of Chicago

64—Long's Tourist Court—11U— U.S. 30 at Indiana State Line

Chicago Heights, Ill. 28 Mi. S.E. of Chicago

65—Plaza Motel—20U—

U.S. 41, S. of U.S. 30

Dyer, Indiana 35 Mi. S.E. of Chicago

### Flame-Plating Cuts Anvil Block Costs

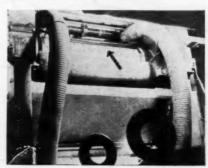
Anvil blocks used in a cardboard box blanking machine manufactured by the E. G. Staude Co., Inc., St. Paul, Minn., are mounted on a roll opposing the cutter and scorer blades and thus are subjected to severe wearing action. To secure efficient operation, these anvils must be replaced frequently.

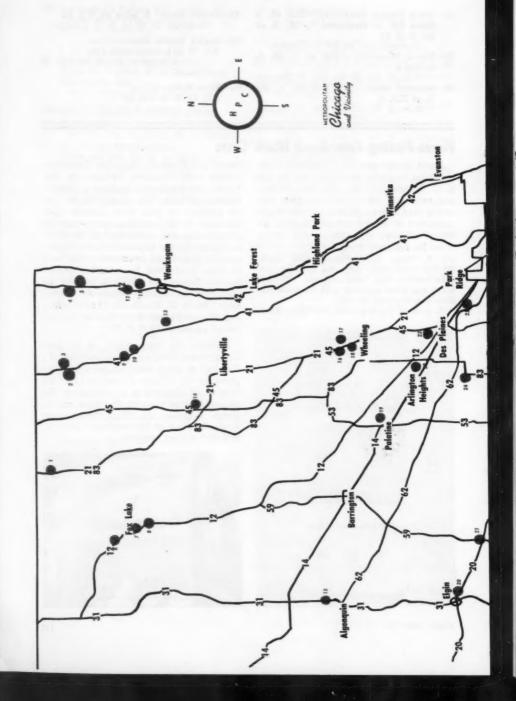
(A) A Worn, Flame-Plated anvil block, (B) The anvil block after the tungsten carbide coating has been stripped. (C) This block has been replated with tungsten carbide and is ready for use.

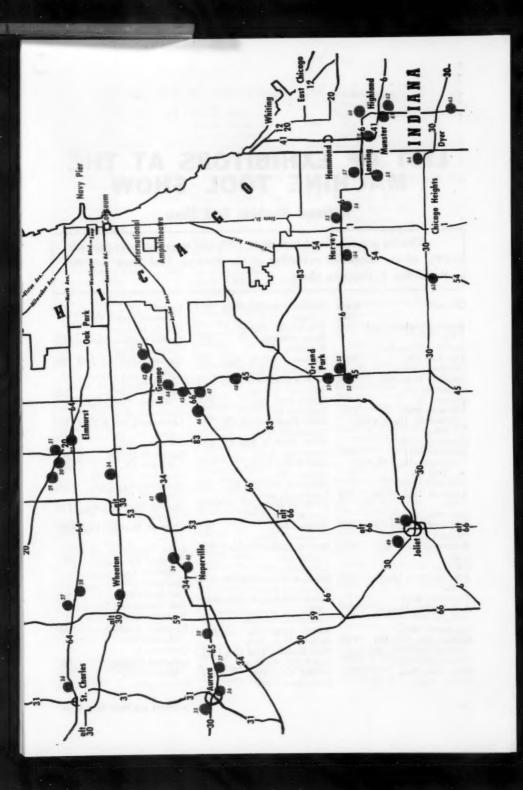
A user of these anvils, the Ohio Box-

board Co., Rittman, Ohio, has the anvils coated with tungsten carbide by the Linde Air Products Company's Flame-Plating process. The plated blocks last an average of four times longer than unplated parts, reducing down-time to a minimum, and cost only half as much as the number of unplated blocks necessary to give equal production. The cost of these parts will be reduced further in the future for the blocks can be stripped and replated whenever necessary. The E. G. Staude Co. is now offering Flame-Plated anvil bocks as optional equipment.

Because the temperature of the part being plated does not exceed 400 deg. F., finished or semi-finished parts can reportedly be Flame-Plated without danger of distortion or changing the physical properties of the base metal. Arrow indicates the Flame-Plated anvil blocks in place in the cardboard box cutting and scoring machine.







# LIST OF EXHIBITORS AT THE MACHINE TOOL SHOW

### **National Machine Tool Show**

This list is correct as of June 30th, 1955, and represents approximately 99% of the companies exhibiting at the Machine Tool Show and the Production Engineering Show.

Company	Booth No.	Baldwin-Lima-Hamilton	203	Carboloy Div., General Electric Co.,	109
Abrasive Machine Tool	317	Philadelphia, Penna.		Detroit, Michigan	
Co.,		Barber-Colman	221	Carlton Machine Tool Co	. 919
East Providence, R. I.		Rockford, Ill.		Cincinnati, Ohio	,
Ajax Co., The,	1309	Bardons & Oliver, Inc.,	325	Cincinnati Bickford Tool	901
Cleveland, Ohio	2005	Cleveland, Ohio		Con	201
American Gage and	417	W. F. & John Barnes Co., 1	1223	Cincinnati, Ohio	
Machine Co.,	***	Rockford, Illinois		Cincinnati Gilbert	816
Chicago, Ill.		Barnes Drill Co.,	818	Machine Tool Co.,	0.0
American Steel	1121	Rockford, Ill.		Cincinnati, Ohio	
Foundries, Elmes En			515	Cincinnati Lathe & Tool	309
Div.,	P	Springfield, Mass.		Co.,	302
Cincinnati, Ohio		Beatty Mach. & Mfg. Co.	614	Cincinnati, Ohio	1. 12
American Steel	1121	Cambridge, Mass.		Cincinnati Milling	306
Foundries, King Mach		Besly-Welles Corp.,	911		1205
Tool Div.,		Chicago, Ill.		Cincinnati, Ohio	
Cincinnati, Ohio		Blanchard Machine Co.,	406	Cincinnati Shaper Co.,	1105
American Tool Works	420	Cambridge, Mass.		Cincinnati, Ohio	
Co.,			1414	Clearing Machine Corp.,	716
Cincinnati, Ohio		Canton, Ohio		Chicago, Ill.	
F. E. Anderson Oil Co.,	225	Bodine Corp.,	205	Cleerman Machine Tool	1007
Portland, Conn.		Bridgeport, Conn.		Co.,	
Armstrong-Blum Mfg.	416	Boye & Emmes Machine	314	Green Bay, Wis.	
Co.,		Tool Co.,		Cleveland Automatic	412
Chicago, Ill.		Cincinnati, Ohio		Machine Co.,	712
Arter Grinding Machine	1308	Brown & Sharpe Mfg. Co.,	520	Cincinnati, Ohio	
Co.,		Providence, R. I.			4 4 4 6
Worcester, Mass.		Bryant Chucking Grinder I	1015	Cleveland Crane	1418
Avey Drilling Machine	324	Co.,		& Engineering Co.,	
Co.,		Springfield, Vermont		Wickliffe, Ohio	
Cincinnati, Ohio		Buffalo Forge Co.,	610	Cleveland Grinding	810
Axelson Mfg. Co., Div.,	519	Buffalo, New York		Machine Co.,	
Pressed Steel Car Co.		Buhr Machine Tool Co., 1	1315	Cleveland, O.	
Los Angeles, Calif.		Ann Arbor, Michigan		Cleveland Tapping	409
Baker Bros., Inc.,	1421		1213	Machine Co.,	
		Bridgeport, Conn.		Canton, Ohio	
Toledo, Ohio		Bridgeport, Conn.		Canton, Ohio	

Colonial Broach Co, Detroit, Michigan Cone Automatic Machine Co, Inc., Windsor, Vermont Consolidated Machine Tool Corp., Rochester, New York Covel Mig. Co., Benton Harbor, Mich. Cross Co., The, Detroit, Michigan Danly Machine Co., Estens Milwaukee, Wis. Posteriot, Michigan Specialities, Inc., Columbus, Ohio Devileg Machine Co., Eastern Machine Co., Corp., Columbus, Ohio Edlund Machine Co., Divi, Branco Machine Co., Divi, Branco Machine Co., Divi, Branco Machine Co., Divi, Branco Machine Co., Poliv, Branco Machine Co., Extern Machine Co., Corp., Corp	*					
Cone Automatic Machine Co., Inc., Windsor, Vermont Consolidated Machine Tool Corp., New Haven, Conn. Giddings & Lewis Corp., Rochester, New York Corost Co., The, Detroit, Michigan Danly Machine Specialties, Inc., Chicago, Ill. Detroit, Michigan Danly Machine Specialties, Inc., Chicago, Ill. Devlieg Machine Co., Columbus, Ohio Devlieg Machine Co., Corp., New Haven, Conn. Gould & Eberhardt, Inc., 1424 Irvington, N. J. George Gorton Machine Co., Corp., Racine, Wis. Machine Co., Racine, Wis. Machine Co., Racine, Wis. Machine Co., Corp. Waynesboro, Penna. Laplointe Machine Co., Co., Corp. Corlumbus, Ohio Corp. Corlumbus, Ohio Corp. Corp. Machine		1112		315		123
Machine Co., Inc., Windsor, Vermont Consolidated Machine Tool Corp., Rochester, New York Covel Mg. Co., Enton Harbor, Mich. Cross Co., The, Derviot, Michigan Danly Machine Specialties, Inc., Chicago, Ill. Davis & Thompson Co., Milwaukee, Wis. Denison Engr. Co., Corp., Row Haven, Conn. Economy Engr. Co., Edid & Eberhardt, Inc., Corp., Corp., Corp., New Haven, Conn. Giddings & Lewis Machine Co., Ross & DeLecuw Milwaukee, Wis. Denison Engr. Co., Corp., New Haven, Conn. Giddings & Lewis Machine Co., Ross & DeLecuw Milloughby, Ohio Edlund Machinery Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Detroit, Mich. Framen Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, Vt. Ferracute Machine Co., Rosside Machine Tool Co., Corp. Muskegon, Mich. Frauenthal Div., Soff Engr. Co., Politakary, Indiana Fellows Gear Shaper Co., Springfield, Vt. Ferracute Machine Co., French Burt Co., Corp. Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, O. Corp. Muskegon, Mich. Frauenthal Div., St. Euwisson, Wis. Free Rorp., 407 Elkhart, Ind. Lake Erie Engineering 1310 Corp., Wuynesboro, Penna. LaPointe Machine Co., Unidon, Machine Co., St. Louis, Misch. God to Lac, Wis. Corp., St. Louis, Machine Tool Co., St. Louis, Machine Tool Co., St. Lebus, Machine Tool Co., St. Louis, Misch. God to Lac, Wis. Corp., St. Louis, Misch. God to Lac, Wis. Corp., St. Louis, Machine Tool Co., St. Louis, Misch. God to Lac, Wis. Corp., St. Louis, Misch. God to Lac, Wis. Corp. St. Louis, Machine Co., St. Louis, Misch. Hardion Co., St. Louis, Misch. Hard		401				1210
Windsor, Vermont Consolidated Machine Tool Corp., Rochester, New York Covel Mfg. Co., Benton Harbor, Mich. Cross Co., The, Detroit, Michigan Danly Machine Specialties, Inc., Chicago, Ill. Detroit, Michigan Davis & Thompson Co., Columbus, Ohio DeVlieg Machine Co., Solution Serew Corp., New Haven, Conn. Gould & Eberhardt, Inc., 1424 Irvington, N. J. George Gorton Machine Co., Corp., New Haven, Conn. Gould & Eberhardt, Inc., 1424 Irvington, N. J. George Gorton Machine Co., Corp., New Haven, Conn. Gould & Eberhardt, Inc., 1424 Irvington, N. J. Greelee Bros. & Co. Greelee Bros. & Co. Solution Machine Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Springfield, Vt. Federal Press Co., Springfield, Vt. Ferracute Machine Co., Springfield, O. Springfiel		401		200		1218
Consolidated Machine Tool Cop., 1700 Corp., 1800 Corp.				706		
Rochester, New York Covel Mfg. Co., Benton Harbor, Mich. Cross Co., The, Detroit, Michigan Specialties, Inc., Chicago, Ill. Detroit, Michigan Corp., Columbus, Ohio Delvileg Machine Co., Sement Machine Screw Corp., New Haven, Conn. Goldings & Lewis Machine Co., Fond du Lac, Wis. Madison, Wis. Madison, Wis. Machine Co., Madison, Wis. Machine Co., Machine Co., Reine, Wis. Machine Co., Machine Co., Machine Co., Machine Co., Reine, Wis. Machine Co., Machine Co.		015		000		
Rochester, New York Covel Mfg. Co., Benton Harbor, Mich. Cross Co., The, Detroit, Michigan Danly Machine Specialties, Inc., Chicago, Ill. Davis & Thompson Co., Co., Co., Cacin. Corp., Chicago, Ill. Corp., Co., Co., Co., Co., Co., Co., Co., Co		217		, 223		1 915
Covel Mfg. Co., 720 Benton Harbor, Mich. Cross Co., The, 1118 Detroit, Michigan Specialties, Inc., Chicago, Ill. Davis & Thompson Co., 602 Milwaukee, Wis. Davis & Thompson Co., 819 Columbus, Ohio Detroit, Michigan Eastern Machine Co., 1317 Detroit, Michigan Eastern Machine Screw Corp., New Haven, Conn. Economy Engr. Co., Willoughby, Ohio Edlund Machinery Co., Div., Bradley-Edlund Corp., Corluda, New York Ex-Cell-O Corp., Springfield, Vt. Ferracute Machine Co., Elkhart, Indiana Fellows Gear Shaper Co., Bridgeton, N. J. Fritchburg, Mass. Princelled, Vt. Ferracute Machine Co., Erickburg, Engr. Co., 205 Fitchburg, Mass. Corp., Springfield, Vt. Ferracute Machine Co., 1409 Cleveland, Ohio Foot-Engr. Co., Milwaukee, Wis. Co., Grand Rapids, Mich. Gallmeyer & Livingston Co., Kaukauna Machine Co., Friechen Machine Co., Tree, Savadon Engr. Corp., Muskegon, Mich. Gallmeyer & Livingston Co., Grand Rapids, Mich. Gardner Machine Co., 1115 Corp., Walkauna Machine Co., 1150 Corp., Walkauna Machine Co., 1160 Corp., Waynesboro, Penna. Laroint Machine Co., 1120 Corp., Waynesboro, Penna. Larointe Machine Co., 11120 Corp., Waynesboro, Penna. Larointe Machine Co., 1120 Corp., Waynesboro, Penna. Larointe Machine Co., 1221 Corp., Waynesboro				710		
Benton Harbor, Mich. Cross Co., The, Cross Co., The, Cross Co., The, Detroit, Michigan Danly Machine Specialities, Inc., Chicago, Ill. Davis & Thompson Co., Columbus, Ohio Devlieg Machine Co., Denison Engr. Co., Columbus, Ohio Devlieg Machine Co., Denison Engr. Co., Corp., Resington, Conn. Gould & Eberhardt, Inc., 1424 Lake Erie Engineering Corp., Rensington, Conn. Gould & Eberhardt, Inc., 1424 Landis Machine Co., Kensington, Conn. Gould & Eberhardt, Inc., 1424 Landis Machine Co., Kensington, Conn. Gould & Eberhardt, Inc., 1424 Landis Tool Co., L & J Press Corp., 407 Waynesboro, Penna. Landis Tool Co., Co., Waynesboro, Penna. Landis Tool Co., Landis Tool Co., Landis Machine Co., Indian Sachine Co., Co., Co., Machine Co., Co., Landis Machine Co., Indian Sachine Co., Indian Sachine Co., Co., Co., Co., Hamilton Tool Co., Hamilton Tool Co., Div., Bradley-Edlund Corp., Div. The Whitney Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Div., The Whitney Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Div., The Whitney Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Div., The Whitney Co., Div.,		720		710		418
Cross Co., The, Detroit, Michigan Danly Machine Specialties, Inc., Chicago, Ill. Davis & Thompson Co., 602 Milwaukee, Wis. Devision Engr. Co., Power Haven, Conn. Economy Engr. Co., Villoughby, Ohio Edlund Machinery Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Ortland, New York Ex-Cell-O Corp., Cortland, New York Ex-Cell-O Corp.,		,20				, 110
Detroit, Michigan Danly Machine Specialties, Inc., Chicago, Ill. Detroit, Michigan Cop., Columbus, Ohio DeVlieg Machine Co., Seatern Machine Co., Willoughby, Ohio Edlund Machinery Co., Torland, New York Ex-Cell-O Corp., Cortland, New York Ex-Cell-O Corp., Springfield, Vt. Frarcaute Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, Ohio Springfield, Ohio Springfield, Ohio Foote-Burt Co., Co., Springfield, Ohio Corp., Machine Co., Springfield, Ohio Springfield, Ohio Frauenthal Div., The Kaydon Engr. Corp., Muskegon, Mich. Frauenthal Div., The Kaydon Engr. Corp., Muskegon, Mich. Grand Rapids, Machine Co., 6115 Groge Georon Racine, Wis. Gas & DeLeeuw 1113 Machine Co., Racine, Wis. Gas & DeLeeuw 1113 Machine Co., Racine, Wis. Goss & DeLeeuw 1113 Machine Co., Racine, Wis. Goss & DeLeeuw 1113 Machine Co., Racine, Wis. Goss & DeLeeuw 1113 Machine Co., Racine, Wis. Gosld & Eberhardt, Inc., 1424 Hamilton, Ohno Greenlee Bros. & Co. 1221 Hamilton Tool Co., Pludson, Mass. R. K. LeBlond Machine 1313 Tool Co., Cop. Hudson, Mach. R. K. Eblond Machine Co., 1115 Maynesboro, Penna. Lapointe Machine Co., 1400 Cop. Waynesboro, Penna. Cop. Puludson, Msc. Na. Lapointe Machine Co., 1115 Maynesboro, Penna. Cop. Puludson, Msc. Na. Lapointe Machine Co., 1100 Cop. Walloson, Mich. R. K. Eblond Machine Co. 1116 Cop. Warnesboro, Penna. 1120 Cop. Walloson, Mich. Sa. F. K. LeBlond		1118		1413		
Danly Machine Specialties, Inc., Specialties, Inc., Chicago, Ill. Davis & Thompson Co., 602 Denison Engr. Co., Columbus, Ohio DeVlieg Machine Co., Corp., Specialties, Wis. Denison Engr. Co., Columbus, Ohio Corp., Columbus, Ohio DeVlieg Machine Co., Specialties, Wis. Corp., New Haven, Conn. Economy Engr. Co., Willoughby, Ohio Edlund Machinery Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Co., Cortland, New York Ex-Cell-O Corp., Cortland		1110		1113		407
Specialties, Inc., Chicago, Ill. Obavis & Thompson Co., 602 Milwaukee, Wis. Delison Engr. Co., Columbus, Ohio Delvileg Machine Co., 1317 Deltroit, Michigan Eastern Machine Screw Corp., New Haven, Conn. Economy Engr. Co., Div., Bradley-Edlund Corp., Ocrtland, New York Ex-Cell-O Corp., Detroit, Mich. Fameo Machine Co., Springfield, V. Ferracute Machine Co., Springfield, V. Frence Burs. Corp., Muskegon, Mich. Frauenthal Div., The Kaydon Engr. Corp., Muskegon, Mich. Gallmeyer & Livingston Corp., Machine Co., Sate Becheaved, Inc., 1424 Hamilton Tool Co., Leandis Machine Co., Waynesboro, Penna. Landis Machine Co., Waynesboro, Penna. Landis Tool Co., Vaynesboro, Penna. Lades Trie Engineering 1310 Corp., Waynesboro, Penna. Lades Trie Engineering 1310 Corp., Waynesboro, Penna. Lades Trie Engineering 1310 Corp., Waynesboro, Penna. Lades Machine Co., 1120 Landis Machine Co., 1221 Machine Co., 807 Hudson, Mass. Lapeinte Machine Co., 1220 Co., Cincinnati, Ohio Reselved By Agenthine Co., 201 Fuldson, Mas. R. LeBlond Machine Co., 1220 Lees-Bradner Co., 1221 Machine Co., 1221 Machin		1302		1019		107
Chicago, Ill. Davis & Thompson Co., 602 Milwaukee, Wis. Denison Engr. Co., 819 Columbus, Ohio DeVlieg Machine Co., 1317 Detroit, Michigan Eastern Machine Screw Corp., New Haven, Conn. Economy Engr. Co., 704 Willoughby, Ohio Edlund Machinery Co., 115 Div., Bradley-Edlund Corp., Corland, New York Ex-Cell-O Corp., 1319 Exchell-O Corp., 1319 Elikhart, Indiana Fellows Gear Shaper Co., Springfield, V. Ferracute Machine Co., Springfield, V. Ferracute Machine Co., 1419 Eitchburg Engr. Corp., 1519 Fitchburg Engr. Corp., 1519 Fitchburg Engr. Corp., 1519 Fitchburg Engr. Corp., 1519 Co., Bridgeton, N. J. Fitchburg Engr. Corp., 1519 Gleveland, Ohio Posdick Machine Tool Co., 201 Co., Bridgeton, N. J. Fitchburg Engr. Corp., 1519 Gleveland, Ohio Posdick Machine Tool Co., 201 Co., Bridgeton, N. J. Fitchburg Engr. Corp., 1409 Gleveland, Ohio Fosdick Machine Tool Corp., Muskegon, Mich. Framenthal Div., Jackson, Mich. Gallmeyer & Livingston Con. Grand Rapids, Mich. Gardner Machine Co., 1115  Exercell-O Corp., 1219 Buffalo, N.Y. Landis Machine Co., 1420 Waynesboro, Penna. LaPointe Machine Co., 1420 Hamilton Ohio Co., 2121 Hamilton, Ohio Co., 212 Hamilton, O		1302		1012		1210
Davis & Thompson Co., 602 Milwaukec, Wis. Denison Engr. Co., 819 Columbus, Ohio DeVlieg Machine Co., 1317 Detroit, Michigan Corp., New Haven, Con. Economy Engr. Co., 201 Div., Bradley-Edlund Corp., Ortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich. Famco Machine Co., 507 Renosha, Wis. Federal Press Co., Elkhart, Indiana Fellows Gear Shaper Co., 507 Eikhart, Indiana Fellows Gear Shaper Co., 507 Fitchburg Engr. Corp., 87 Fitchburg Engr. Corp., 1406 Fostick Machine Tool Co., 1407 Co., 1408 Fitchburg Engr. Corp., 1408 Fitchburg Engr. Corp., 1409 Fitchburg						1310
Machine Co., Denison Engr. Co., Columbus, Ohio DeVlieg Machine Co., 1317 Detroit, Michigan Estern Machine Screw Corp., New Haven, Conn. Economy Engr. Co., Willoughby, Ohio Edlund Machiner Co., 155 Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich. Fameo Machine Co., Ekhart, Indiana Pellows Gear Shaper Co., Springfield, Vt. Perracute Machine Co., Erstenburg Engr. Corp., Fitchburg Engr. Corp., Fitchburg Engr. Corp., Eitchburg Machine Tool Co., 1406 Corp., Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich. Federal Press Co., 201 Elkhart, Indiana Fellows Gear Shaper Co., 1416 Co., Springfield, Vt. Perracute Machine Co., 1409 Cleveland, Ohio Fosdick Machine Tool Co., 1409 Cleveland, Ohio Fosdick Machine Tool Co., 1409 Cleveland, Ohio Fox Engr. Co., 1409 Cleveland, Ohio The Kaydon Engr. Corp., Muskegon, Mich. Gallmeyer & Livingston Co., 1410 Gallmeyer & Livingston Co., 1410 Gallmeyer & Livingston Nich. Gallmeyer & Livingston Co., 1410 Grand Rapids, Mich. Gardner Machine Co., 1410 Grand Rapids, Mich. Gardner Machine Co., 1115 Co. A. Gray Co., 1120 Co., 1120 Co., 1212 Hamilton Tool Co., 212 Hamilton, Ohio Hason-Whitney Chain Co., 200 Hartford, Conn. Hartford Special Machine Co., 902 Worcester, Mass. Lipe-Rollway Corp., 803 Syracuse, N.Y. Lees-Brader Co., 1104 Worcester, Mass. Lipe-Rollway Corp., 803 Syracuse, N.Y. Lege-Brader Co., 1114 Lardis Tool Co., 1212 Co., 201 Co.,		602		1112		
Denison Engr. Co., Columbus, Ohio DeVlieg Machine Co., 1317 Detroit, Michigan Eastern Machine Screw Corp., New Haven, Conn. Economy Engr. Co., Willoughby, Ohio Edlund Machinery Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Detroit, Mich. Famco Machine Co., Ex-Cell-O Corp., Corbosha, Wis. Federal Press Co., Elkhart, Indiana Fellows Gear Shaper Co., Bridgeton, N. J. Fitchburg, Mass. Foote-Burt Co., Cincinnati, Ohio Fosdick Machine Tool Co., Co., Cincinnati, Ohio Fosdick Machine Tool Foote-Burt Co., Cincinnati, Ohio Fosdick Machine Tool Fox Engr. Co., Co., Cincinnati, Ohio Fox Engr. Co., Co., Cincinnati, Ohio Fox Engr. Co., Ex-Cell-O Corp., Co., Cincinnati, Ohio Fox Engr. Co., Ex-Cell-O Corp., Co., Co., Co., Co., Co., Co., Co., Co		., 002		1113		1406
Columbus, Öhio DeVlieg Machine Co., 1317 DeVlieg Machine Co., 1317 Detroit, Michigan Eastern Machine Screw Corp., New Haven, Conn. Economy Engr. Co., Willoughby, Ohio Edlund Machinery Co., 15 Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich. Fameo Machine Co., 507 Kenosha, Wis. Federal Press Co., 516 Elkhart, Indiana Fellows Gear Shaper Co., Springfield, Vt. Ferracute Machine Co., 702 Fitchburg Engr. Corp., 208 Fitchburg Sars. Foote-Burt Co., 1409 Cleveland, Ohio Foote-Burt Co., 1409 Cleveland, Ohio Fost Engr. Co., 1409 Cleveland, Ohio Frauenthal Div., The White Co., 1111 Machine Co., Springfield, O. Frauenthal Div., The White Co., 1111 Machine Co., Springfield, O. Frauenthal Div., The White Co., 1111 Machine Co., Springfield, O. Frauenthal Div., The White Co., 1111 Machine Co., Springfield, O. Frauenthal Div., The White Co., 1111 Machine Co., Springfield, O. Frauenthal Div., The White Co., 1111 Machine Co., Springfield, O. Frauenthal Div., The White Chain Co., 1111 Machine Co., Springfield, O. Frauenthal Div., The Whitney Chain Co., 1111 Machine Co., 1100 Co., 1100 Co., 11117 Waynesboro, Penna. LaPointe Machine Tool Co., 1121 Napinte Machine Tool Co., 1121 Napinte Machine Tool Co., 1212 LaPointe Machine Tool Co., 1121 Napinte Machine Tool Co., 1212 LaPointe Machine Tool Co., 1121 Napinte Machine Tool Co., 1212 LaPointe Machine Tool Co., 1121 Napinte Machine Tool Co., 1212 Namilton, Ohio Co., 201 Hamilton Tool Co., 201 H		910				1400
DeVlieg Machine Co., Detroit, Michigan  Corp., New Haven, Conn. Economy Engr. Co., Total Machinery Co., Div. Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich. Famco Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, Vt. Ferracute Machine Co., Springfield, Ohio Elkhart, Indiana Fellows Gear Shaper Co., Springfield, Ohio Elkhart, Indiana Fello		913		1424		1117
Detroit, Michigan Eastern Machine Screw Corp., New Haven, Conn. Economy Engr. Co., Willoughby, Ohio Edlund Machinery Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., Corp., Cortland, New York Ex-Cell-O Corp., Co		1217		1424		1117
Eastern Machine Screw Corp., Corp., Corp., New Haven, Conn. Economy Engr. Co., Willoughby, Ohio Edlund Machinery Co., Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich. Farmen Machine Co., Sort Ederal Press Co., Elkhart, Indiana Fellows Gear Shaper Co., Springfield, Vt. Ferracute Machine Co., Bridgeton, N. J. Fitchburg Engr. Corp., Fitchburg Engr. Corp., Elkhart, Indiana Foot Eleveland, Ohio Fitchburg Engr. Corp., Elkhart, Indiana Fitchburg Engr. Corp., Elkhart, Indiana Foot Eleveland, Ohio Fitchburg Engr. Corp., Elkhart, Indiana Fitchburg Engr. Corp., Elkhart, Indiana Fitchburg Engr. Corp., Elkhart, Indiana Foot Eleveland, Ohio Fitchburg Engr. Corp., Elkhart, Ind. Springfield, Vt. Ferracute Machine Co., 1409 Cleveland, Ohio Foot Eleveland, Ohio Foot Eleveland, Corp., Elkhart, Ind. Illinois Tool Works, 1323 Cincinnati, Ohio Foot Eleveland, Corp., Elkhart, Ind. Illinois Tool Works, 1323 Cincinnati, Ohio Foot Eleveland, Ohio Foot Engr. Co., Elkhart, Ind. Illinois Tool Works, 1323 Cincinnati, Ohio Foot Eleveland, Corp., Elkhart, Ind. Illinois Tool Works, 1323 Cincinnati, Ohio Foot Eleveland, Corp., Elkhart, Ind. Illinois Tool Works, 1323 Cincinnati, Ohio Foot Eleveland, Corp., Elkhart, Ind. Inc., Logansport Machine Co., 1110 Cincinnati, Ohio Foot Eleveland, Corp., Elkhart, Ind. Inc., Logansport, Ind. Mattison Machine Works, 1422 Rockford, Ill. Mattion Tool Co., 1220 Corp., Elkhart, Ind. Illinois Tool Works, 1323 Chicago, Ill. Johnson Machine & 1111 Detroit, Mich. Mister Machine Co., 1410 Minster Machine Co., 1410 Moine, Ill. Muson Machine Tool Co., 1410 Minster, O. Moline Tool Co., 1304 Moline, Ill. Monarch Machine Tool Co., 201 Cincinnati, Ohio Foot Eleveland, O. Leland-Gifford Co., 201 Cincinnati, Ohio Logansport, Ind. Mattison Machine Co., 1114 Inc., Logansport, Ind. Mattison Machine Co., 1115 Inc., Logansport, Ind. Mattison Machine Co., 1110 Minster Machine Co., 1100 Minster		1317		1120		707
Corp., New Haven, Conn. Economy Engr. Co., 704 Willoughby, Ohio Edlund Machinery Co., 115 Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich. Eracente Machine Co., 507 Kenosha, Wis. Federal Press Co., Elkhart, Indiana Fellows Gear Shaper Flichburg Engr. Corp., Britchburg, Mass. Foote-Burt Co., 1409 Cleveland, Ohio Frederal, Ohio Frichburg, Mass. Foote-Burt Co., 1409 Cleveland, Ohio Cleveland, Ohio Frost Engr. Co., 200 Cleveland, Ohio Frauenthal Div., Co., 201 The Whitney Chain Co., 201 Hartford, Conn. Har		201		1120		707
New Haven, Conn.  Economy Engr. Co., Willoughby, Ohio Edlund Machinery Co., Ortland, New York Ex-Cell-O Corp., Cortland, New York Ex-Cell-O Corp., Div. The Whitney Chain Co. Hartford, Conn. Hartford Special Hartford Special Hartford Conn. Hartford Special Hartford, Conn. Hartford, Conn. Hartford, Conn. Hartford, Conn. Hartford, Conn. Heald Machine Co., Springfield, Vt. Fedraal Press Co., Springfield, Vt. Ferracute Machine Co., Springfield, Vt. Foote-Burt Co., Cleveland, Ohio Fost Engr. Corp., Springfield, Ohio Fox Engr. Co., The Kaydon Engr. Corp., Muskegon, Mich. Frauenthal Div., The Whitney Chain Co. Hartford, Conn. Hartford Special Hartford Special Hartford Special Hartford Conn. Hartford Special Hartford Conn. Hartford Special Hart		201		1001		
Economy Engr. Co., Willoughby, Ohio  Edlund Machinery Co., 115  Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., 1319  Detroit, Mich. Famce Machine Co., 507  Kenosha, Wis. Felderal Press Co., Elkhart, Indiana Pellows Gear Shaper Co., Springfield, Vt. Ferracute Machine Co., 507  Bridgeton, N. J. Fitchburg Engr. Corp., Fitchburg Engr. Corp., Fitchburg Mass. Foote-Burt Co., Co., 1409  Cleveland, Ohio Fox Engr. Co., 1409  Cincinnati, Ohio Frauenthal Div., Co., 1419 Jackson, Mich. Frauenthal Div., Machine Co., Grand Rapids, Mich. Gardner Machine Co., 1115  Edlund Machinery Co., 1115 Hamston Ohio Hamson-Whitney Co., 807 Lanson-Whitney Co., 807 Lees-Bradner Co., 701 Cleveland, O. Leland-Gifford Co., 321 Worcester, Mass. Lipe-Rollway Corp., 803 Lipe-Rollway Corp., 803 Worcester, Mass. Lipe-Rollway Corp., 803 Worcester, Mass. Lipe-Rollway Corp., 803 Lipe-Rollway Corp., 803 Worcester, Mass. Lipe-Rollway Corp., 803 Lipe-Rollway Corp., 803 Worcester, Mass. Lipe-Rollway Corp., 803 Worcester, Mass. Lipe-Rollway Corp., 803 Worcester, Mass. Lipe-Rollway Corp., 803 Machine Co., 902 Cincinnati, Ohio Mactison Machine Co., 718 Mount Gilead, O. Illinois Tool Works, 1323 Chicago, Ill. Johnson Machine & 411 Machine Co., 718 Mount Gilead, O. Illinois Tool Works, 1323 Chicago, Ill. Dones & Lamson Machine Co., 1410 Machine Co., 1410 Machine Co., 180 Mount Gilead, O. Illinois Tool Works, 1323 Chicago, Ill. Dones & Lamson Machine Co., 180 Moine Tool Co., 1220 Moine Tool Co., 1220 Moine Tool Co., 1304 Moine Tool Co., 1304 Moine Tool Co., 1210 Moine Tool Co., 1220 Morris Machine Tool Co., 1220 Morris				1221		
Willoughby, Ohio Edlund Machinery Co., 115 Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich.  Ex-F. Houghton Co., 100 Detroit, Mich.  Ex-F. Houghton Co., 1318 Detroit, Mich.  Ex-F. Houghton Co., 1318 Detroit, Mich.  Ex-F. Houghton Co., 1318 Machine Co., 1319 Detroit, Mich.  Ex-F. Houghton Co., 1318 Machine Tool Co., 1220 Detroit, Mich.  Ex-F. Houghton Co., 1318 Machine Tool Co., 1220 Detroit, Mich.  Ex-F. Houghton Co., 1318 Machine Tool Co., 1220 Detroit, Mich.  Ex-F. Houghton Co., 1318 Machine Tool Co., 1220 Detroit, Mich.  Illinois Tool Works, 1323 Michiner Tool Co., 1304 Moline Tool Co., 1304 Moline Tool Co., 1304 Moline, Ill.  Monarch Machine Tool Co., 912 Corp., 1316 Machine Co., 1409 Minster Machine Tool Co., 1304 Moline, Ill.  Moli		-		010		1313
Edlund Machinery Co., Div. Bradley-Edlund Corp., Div. The Whitney Chain Corland, New York Co., Ex-Cell-O Corp., 1319 Detroit, Mich. Famce Machine Co., 507 Kenosha, Wis. Federal Press Co., Edland-Gifford Co., Springfield, Vt. Ferracute Machine Co., 702 Fitchburg Engr. Corp., Eitchburg Engr. Corp., Eitchburg Engr. Co., Co., Co., Co., Co., Co., Co., Co.		704		212		
Div., Bradley-Edlund Corp., Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich. Famco Machine Co., 507 Kenosha, Wis. Federal Press Co., Elkhart, Indiana Fellows Gear Shaper Co., Springfield, Vt. Ferracute Machine Co., 702 Bridgeton, N. J. Fitchburg Engr. Corp., 208 Fitchburg Engr. Corp., 1409 Cleveland, Ohio Foote-Burt Co., 1409 Cleveland, Ohio Fook Engr. Co., 1409 Cleveland, Ohio Frauenthal Div., The Whitney Chain Co. Div. The Whitney Chain Co. Leland-Gifford Co., 321 Worcester, Mass. Hartford, Conn. Hatford, Co						-
Cortland, New York Ex-Cell-O Corp., 1319 Detroit, Mich.  Partford, Conn. Hartford, Conn. Hartford, Conn. Federal Press Co., Elkhart, Indiana Fellows Gear Shaper Co., Springfield, Vt. Ferracute Machine Co., Springfield, Vt. Ferracute Machine Co., 1409 Fitchburg Engr. Corp., Eitchburg, Mass. Foote-Burt Co., 1409 Cleveland, Ohio Fosdick Machine Tool Co., Co., Co., Co., The Kaydon Engr. Corp., Muskegon, Mich. Frauenthal Div., Maskegon, Mich. Gallmeyer & Livingston Co., 1319 Hartford, Conn. Hatford, Conn. Hartford, Conn. Hartford, Conn. Hartford, Conn. Hartford, Conn. Hatford, Conn. Logansport Machine Co., 718 Mic		-				701
Ex-Cell-O Corp., Detroit, Mich.  Partford Special  Machine Co., Kenosha, Wis.  Federal Press Co., Elkhart, Indiana  Pellows Gear Shaper  Co., Springfield, Vt.  Ferracute Machine Co., Springfield, Vt.  Ferracute Machine Co., Springfield, Vt.  Fitchburg Engr. Corp., Eitchburg, Mass.  Foote-Burt Co., Clossick Machine Tool Co., Co., Co., Co., Co., Co., Co., Co.,		Corp.,		ain		
Detroit, Mich. Famce Machine Co., Famce Machine Co., Kenosha, Wis. Federal Press Co., Elikhart, Indiana Fellows Gear Shaper Co., Springfield, Vt. Ferracute Machine Co., Fitchburg Engr. Corp., Fitchburg, Mass. Foote-Burt Co., Co., Co., Co., Co., Co., Co., Co.,						321
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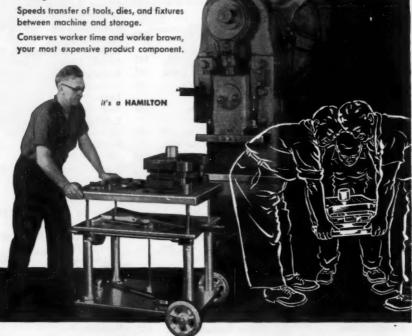
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Lake City, Minn. Optical Gaging Products, Inc.,	114, 115	Square D Co., 404, Detroit, Mich.	700	Racine, Wis.	

CUT COST OF PRECISION GEAR PRODUCTION

THIS FEATURE: "Independent selection of speed, feed and indexing," sets the Hamilton Precision Small Gear Hobber apart from the field,

AND ENABLES the users of this machine to vary speed and feed to suit the material being machined.

THIS FACT, and a "reserve of accuracy" built into the machine, work spindle and hob spindle runout of less than .0002" as an example,

CONTRIBUTES to more gear precision with no sacrifice of gear production,

OR INCREASED gear production with no sacrifice of gear precision, ..... OR BOTH!

Prices and specifications without obligation

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The Hamilton Tool Company **826 South Ninth Street** 

Hamilton, Ohio

IT'S A

Encircle No. 289 on Card, Opposite Page 65

# SANFORD SURFACE GRINDER MODEL MG

# For Dry or Wet Grinding!

Built by manufacturers who concentrate on small grinders only, each Sanford Grinder is an individual project of time tested and proved basic design. Although modest in price, no quality undermining shortcuts are employed to reduce manufacturing costs. Constant repeat orders prove its acceptance.

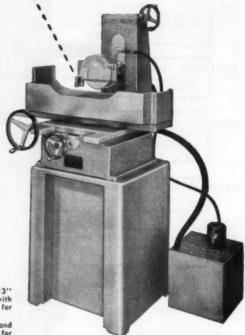
This sensitive machine grinds to micro-inch accuracy with no vibration, with maximum dimensional stability. Here's why:

- Transverse ways are double Vee (VV) Mechanite inserts instead of flat surfaces which depend upon unstable jibs for alignment and accuracy.
- Needle, Ball and Oilite Anti-Friction bearings are used throughout.
   Alignments are electronically checked
- for accuracy.

  Precision slides are ground, lapped and hand spotted.
- Dials are large and legible.

SPECIFICATIONS — 83/4" transverse — 13" longitudinal—12" vertical under 7" wheel with Adapter. Approximate weight 630 lbs. Send for illustrated bulletin.

Replacement parts, special attachments and reconditioning facilities are available. Send for price list.



\*With optional equipment



MANUFACTURING CORP.

1026 Commerce Ave., Union, N. J.

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MACHINE and TOOL BLUE BOOK

Union Mfg. Co., New Britain, Conn.	159	Vascoloy-Ramet Corp., Waukegan, Ill.	246, 247	Oakmount, Pa. Wagner Electric Corp.,	129
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	835	E. F. Vilter Sales, Inc. Visual Plant Layouts, Inc.,	456 812	& Clutch Co., Beloit, Wis.	174

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- OUTSIDE DIAMETERS
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O" to 3"
BASIC GAGE

Write for catalog

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## **Coliseum Machinery Show**

Exhibitors as of April 10, 1955. A complete and final list of exhibitors was unavailable at press time.

American Herforder Corp. Chicago, Ill.

American Positive Grip Vise Corp. Willimansett, Mass.

American Pullmax Co., Inc. Chicago, Ill.

Armstrong Brothers Tool Co. Chicago, Ill.

Atlas Press Co. Kalamazoo, Mich.

Baird Machine Co. Stratford, Conn.

Bansbach Machinery Co. Chicago, Ill.

Black Drill Co. Cleveland, Ohio

Boice-Crane Co. Toledo, Ohio

Burg Tool Mfg. Co., Inc. Gardena, Calif.

Cincinnati Mfg. Corp. Cincinnati, Ohio

Commander Mfg. Co. Chicago, Ill.

Crystal Lake Machine Sales Corp. Crystal Lake, Ill.

A. P. de Sanno & Son, Inc. Machinery Division Phoenixville, Pa.

DoAll Company Des Plaines, Ill.

Easco Products
Ann Arbor, Mich.

East Chicago Mach. Tool Corp. East Chicago, Ind.

Electro Arc Sales Co. Ann Arbor, Mich.

Fawick Airflex Div. Fawick Corporation Cleveland, Ohio Fenn Manufacturing Co. Hartford, Conn.

Fenway Mach. Sales Co., Inc. Philadelphia, Pa.

Fumer-Hone Company New Britain, Conn.

James W. George Mchy. Co. Detroit, Mich.

Graham Machine Tool Co. New York, N. Y.

Grand Specialties Co. Chicago, Ill.

Hammond Machinery Builders, Inc. Kalamazoo, Mich.

Hydra-Feed Mach. Tool Corp. So. Norwalk, Conn.

Jiffy Tool Supply Co., Inc. Ferndale, Mich.

Kling Bros. Eng. Works Chicago, Ill,

Lake Shore Engineering Co. Iron Mountain, Mich.

K. O. Lee Co. Aberdeen, S. D.

M.B.J. Export & Import, Ltd. Bronx, N. Y.

Machinery Dealers National Ass'n. Washington, D.C.

Manning, Maxwell & Moore, Inc. Shaw-Box Crane & Hoist Div. Muskegon, Mich.

Maserati Corp. of America Westbury, L.I., N.Y.

Mead Specialties Co. Chicago, Ill.

Metal Removal Co. Chicago, Ill. Neff, Kohlbusch & Bissell, Inc. Chicago, Ill.

Nicholas Equipment Co. Bellevue, Ohio

Nord International Corp. Orange, N. J.

O'Neil-Irwin Mfg. Co. Lake City, Minn.

Pangborn Corp. Hagerstown, Maryland

Portage Double-Quick Tool Co. Akron, Ohio

Portage Machine Co. Akron, Ohio

Production Machine Co. Greenfield, Mass.

Reeves Pulley Co. Columbus, Indiana

Geo. T. Schmidt, Inc. Chicago, Ill.

Sealol Corporation Providence, Rhode Island

Service Machine Co. Chicago, Ill.

Sheldon Machine Co., Inc. Chicago, Ill.

Simplex Machine Tool Corp. Milwaukee, Wis.

Skil Corp. Chicago, Ill.

Sleeper & Hartley, Inc. Worcester, Mass.

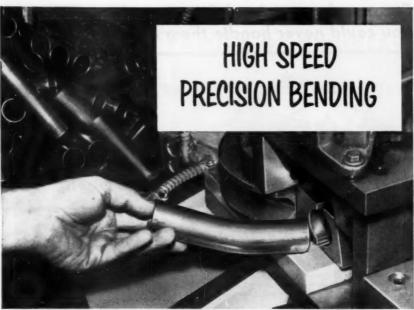
South Bend Lathe Works South Bend, Indiana

U.S. Burke Machine Tool Div. Cincinnati, Ohio

Walker-Turner Div. Kearney & Trecker Corp. Plainfield, N. J.

Wells Manufacturing Corp. Three Rivers, Mich.

Zagar Tool Inc. Cleveland, Ohio



Forming 1.375"x.028" wall annealed steel tubing at General Electric.

# DI-ACRO HYDRA BENDER

Simple and complex bends are being formed at low cost in daily production across the nation with hydraulically operated Di-Acro Benders. The Bender can be delivered completely tooled by the factory for bending tubing, moulding, extrusions and special materials. For a free production estimate, send a dimensional sketch and sample material for your component.





SEND FOR "IT'S EASY TO BEND"

See 2 Di-Acro Exhibits at Chicago Sept. 6-16 Production Eng. Show, BOOTH 125-126, Navy Pier

Metalworking Show, BOOTH 653, Chicago Goliseum pronounced die-ack-ro

di-acro
PRECISION
METALWORKING
MACHINES

O'NEIL-IRWIN MFG. CO., 314 8th Ave., Lake City, Minn.

Encircle No. 291 on Card, Opposite Page 65

# For angular spacing jobs so precise you could never handle them before



A Rotary Table accurate to ± 3 sec. in 360°

No. 2 Moore 11-inch Rotury Table, developed by the builder of the Jig Borer and Jig Grinder.

#### THE FOLLOWING ACCURACY BUILT FOR SHOP USE:

All points in 90° increments, from zero,  $\pm$  1½ sec. All points in 18° increments, from zero,  $\pm$  2 sec. All points in 2° increments, from zero,  $\pm$  4 sec. Worm accuracy,  $\pm$  1 sec. Repetition of settings,  $\pm$  1 sec.  $\pm$  6001° on 10° dia.

How many jobs have slipped by you because the angular spacing requirements were just too much for your equipment?

With Moore's new 11-Inch Rotary Table, you can easily handle the most precise angular measurements. Having an overall performance accuracy of ± 6 seconds throughout the entire 360°, this table is already being used successfully by several leading companies on government-sponsored precision jobs never before accomplished.

This extreme accuracy is achieved by a non-disengagable, threadground worm, combined with accurately spaced teeth of its mating gear. An ultra-sensitive method of angular measurement—interferometric inspection and calibration—used industrially for the first time, assures tooth spacing accuracy within less than ± 4 seconds.

You can use this rotary table for countless precision spacing applications on jig borers and jig grinders. Examples: Spacing holes in a circle on either machine; set at right angle for additional machining and inspection jobs; with its companion unit, the new No. 2 Sine Plate, to produce compound angle settings. Write today for Bulletin RT2.

### MOORE SPECIAL TOOL COMPANY, INC.

728 Union Avenue, Bridgeport 7, Connecticut



Accurate in vertical as well as horizontal position.

Additional vernier permits normal reading even in vertical position.



Accuracy assured by interferometric inspection and calibration. This is the first time industry has used light-wave measuring methods for precise division of the circle.



TO YOUR TOOLROOM

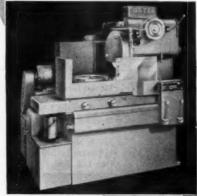
JIG BORERS . JIG GRINDERS . PANTO-CRUSH WHEEL DRESSERS . PRECISION ROTARY TABLES . HOLE LOCATION ACCESSORIES

# ARTER

## FAMILY OF GRINDERS

## MACHINE TOOL SHOW Sopt. 6-17 . Booth 1308

A GENERATION of experience stands behind the ARTER family of grinding machines. Progressively these machines have attained advanced techniques, simplification of grinding processes, closer tolerances. Today ARTER is proud of the family including the newest members, Models E and F Rotary Surface Grinders, making their bows at the Tool Show.



MODEL E - 12" AND 16" ROTARY SURFACE GRINDER

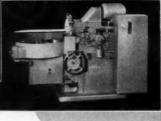


MODEL F 12" ROTARY SURFACE GRINDER





MODEL D—SPECIAL SEMI-AUTOMATIC ROTARY SURFACE GRINDER ARRANGED WITH WORK-LOADING AND PUSH BUTTON GRINDER CYCLE



MODEL 200 CARBIDE TOOL GRINDER



WORCESTER • MASSACHUSETTS
Agents in industrial centers of United States and Canada

Encircle No. 293 on Card, Opposite Page 65

# Restaurant, Hotel, Railroad Stations & Department Store Directory

### Restaurants

A Bit Of Sweden 1015 N. Rush DElaware 7-1492

Agostino's Restaurant 1121 N. State DElaware 7-9862

Alpino Restaurant and Lounge 539 S. Wabash WAbash 2-1928

Athens Restaurant and Lounge

530 S. Halsted MOnroe 6-2072 Bamboo Inn

11 North Clark ANdover 3-1221 The Berghoff

17 W. Adams HArrison 7-3170

Black Onyx 140 E. Walton DElaware 7-1922

Boston Oyster House 21 S. Clark FRanklin 2-9600

Cafe Bellini 1014 N. Rush MOhawk 4-6397

Cafe De Paris 1260 N. Dearborn WHitehall 4-5620

Camelot Restaurant 505 N. Michigan WHitehall 4-4100

Cameo 116 E. Walton SUperior 7-1200 Cape Cod Room

Drake Hotel Michigan at Walton SUperior 7-2200

Club Mona Lisa 422 N. Rush DElaware 7-6724 Corona Cafe

Corona Cafe 531 Rush St. WHitehall 4-9288 Don The Beachcomber 101 E. Walton SUperior 7-8812

Don Roth's New Blackhawk Randolph & Wabash RAndolph 6-2822 Edgewater Beach Hotel

Charterhouse and Rib Room 5300 Sheridan LOngbeach 1-6000

Eitel's Old Heidelberg Randolph near State FRanklin 2-1892

Foley's Steak House 71 E. Adams WAbash 2-9193 Fritzel's

Fritzel's State & Lake ANdover 3-7100 Gibby's Ogden Grill 192 N. Clark ANdover 3-8181

Gus
420 N. Dearborn
DElaware 7-1782
Henrici's
71 W. Randolph
DEarborn 2-1800

Ireland's 632 N. Clark DElaware 7-2020

Jacque's French Restaurant 900 N. Michigan DElaware 7-9040

Johnny's Steak House 517 S. Wabash WEbster 9-7788 L'aiglon

22 E. Ontario DElaware 7-6070 Math Igler's Casino 1627 W. Melrose WEllington 5-2000

Lido Restaurant 82 W. Washington DEarborn 2-3884 Loop Kosher Cafeteria 236 S. Wabash HArrison 7-8814

Lotus Room
LaSalle Hotel
LaSalle & Madison
FRanklin 2-0700
Mexico Lindo
2020 N. Clark
BUckingham 1-9813

Mocha Room
Congress Hotel
520 S. Michigan
HArrison 7-3800

Ong Lok Yun 106 N. Dearborn ANdover 3-8294

Parkway Restaurant 723 N. Michigan MIchigan 2-1013 Peter Piper's 4910 Sheridan Rd.

LOngbeach 1-7643 The Piccadily 410 S. Michigan HArrison 7-1975

Red Star Inn 1528 N. Clark WHitehall 4-9637

Roger's Restaurant 191 W. Madison ANdover 3-6580

Shangri-La 222 N. State CEntral 6-1001

St. Hubert's Old English Grill 316 S. Federal

WEbster 9-8770 Singapore 1011 Rush DElaware 7-9450 Steak House

744 N. Rush DElaware 7-5930

Stock Yard's Inn 42nd and Halsted YArds 7-5580 Sweden House 157 E. Ohio SUperior 7-3350 Swiss Chalet

Bismarck Hotel 171 W. Randolph CEntral 6-0123

Teddy's Italian Restaurant 16 E. Huron MOhawk 4-1448 Victorian Room Palmer House State & Monroe RAndolph 6-7500

Well of the Sea Hotel Sherman Clark & Randolph FRanklin 2-2100 Younker's 51 E. Chicago WHitehall 4-0369

Visit Machine & Tool BLUE BOOK At the International Amphitheatre, Booth 121 Chicago — September 6-17

## E'S A TYPICA HOLDING JOB





### **HOW MANY MORE DO YOU HAVE?**

Here the new Jacobs Model 96 Rubber-Flex Collet Chuck holds a machined part for inspection.

We don't yet know all the applications for this marvelous holding device. We do know it is the most accurate collet chuck in the world . . . that it holds any piece from 1/16" to 13/8" in diameter using only 11 collets, and has a gripping power unmatched by any split steel collets.

What are your work holding jobs for Model 96? Get the

details on this great chuck from your industrial distributor, or write The Jacobs Manufacturing Co., 220 Jacobs Road, West Hartford 10, Conn. Ask for Bulletin 54-CC.



### Chicago Hotel Directory

Ambassador 1300 N. State SUperior 7-7200

Atlantic 316 S. Clark WAbash 2-2646

Belmont 3156 Sheridan BIttersweet 8-2100

Bismarck 175 W. Randolph CEntral 6-0123

Brevoort Madison east of LaSalle FRanklin 2-2363

Congress & Michigan HArrison 7-3800 Conrad Hilton

Michigan at 7th WAbash 2-4400

Rush & Ontario DElaware 7-6700 Dearborn Plaza

1032 N. Dearborn WHitehall 4-6464 Devonshire

19 E. Ohio SUperior 7-4900 Drake

Lake Shore Dr. & Michigan SUperior 7-2200

Eastgate 162 E. Ontario SUperior 7-3580 Edgewater Beach 5349 Sheridan LOngbeach 1-6000 Graemere 3400 W. Washington VAn Buren 6-7600 Hamilton 20 S. Dearborn RAndolph 6-6100

Hayes 64th & University HYde Park 3-4400 Hotel Lincoln 1812 N. Clark

MOhawk 4-3040 Lake Shore Drive 181 E. Lake Shore Dr. SUperior 7-8500

Knickerbocker 163 E. Walton WHitehall 3-2000 LaSalle

LaSalle & Madison

FRanklin 2-0700 Mark Twain 111 W. Division MIchigan 2-7150

Maryland 900 Rush SUperior 7-4568

Morrison Madison & Clark FRanklin 2-9600 New Lawrence 1020 W. Lawrence

LOngbeach 1-2100 North Park 1936 N. Clark MOhawk 4-3200 Palmer House

RAndolph 6-7500

15 E. Monroe

Parkway 2100 Lincoln Park West DIversey 8-5000 Pearson 190 E. Pearson

SUperior 7-8200 Planters 19 N. Clark RAndolph 6-4800

Rancroft 89 W. Randolph FRanklin 2-4740 Rienzi

600 Diversey BUckingham 1-4100 Seneca

Seneca 200 E. Chestnut SUperior 7-2380 Sheraton-Blackstone S. Michigan at 7th HArrison 7-4300 Sheraton

505 N. Michigan WHitehall 4-4100 Sherman Randolph at Clark

FRanklin 2-2100 Somerset 5009 Sheridan LOngbeach 1-0700 St. Clair

SUperior 7-4660 Wellington Arms 2970 Sheridan BIttersweet 8-4600 Windale

162 E. Ohio

6019 N. Winthrop LOngbeach 1-2840 Windermere 1642 E. 56th FAirfax 4-6000

## Chicago Department Stores

Baskins
137 S. State
Carson, Pirie Scott & Co.
State & Madison
Charles A. Stevens
25 N. State
Fair Store
Adams between State and

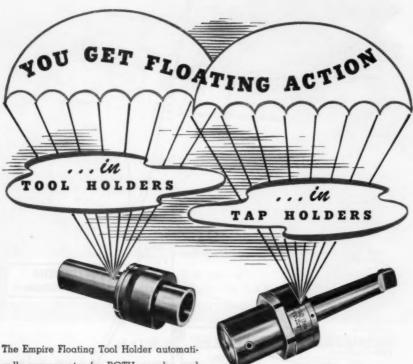
Adams between State and Dearborn Goldblatt's 333 S. State Lytton's 235 S. State

Mandel Bros. State & Madison

Marshall Field 111 N. State Rothschild's 304 S. State

Sears, Roebuck & Co. State & VanBuren Bonwit Teller 830 N. Michigan

Saks Fifth Avenue 669 N. Michigan

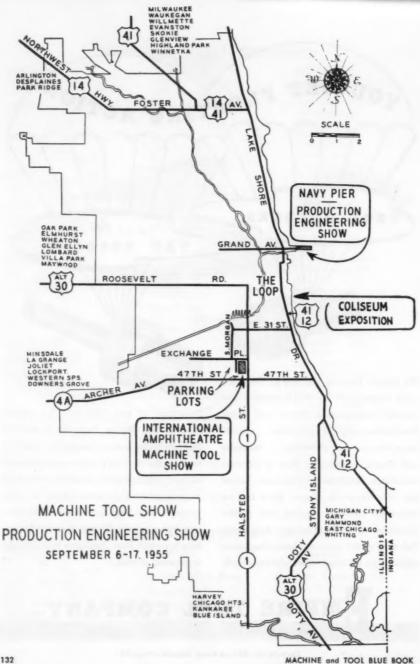


The Empire Floating Tool Holder automatically compensates for BOTH angular and parallel misalignment. Sleeve and shank float independently of each other... achieving a free and easy movement... exclusive with Empire. Amount of float is infinitely adjustable. Minimum maintenance—holder has only five parts. Moving parts ride on rollers for smoother running with perfect alignment... and anti-friction of members. Bell mouths and over-sized holes eliminated, allowing for extremely close tolerance work.

Taps float IN and OUT with the Empire Floating Tap Holder. Designed to prevent freezing under tension caused by drag on the tap. Automatically corrects parallel and angular misalignment. Simple adjustment of locknut provides accurate control of wide range of float. Flotation makes close tolerances easy to hold. No spring or pivot members to restrict float. Available with straight or tapered shanks.

# MPIRE TOOL COMPANY

8780 GRINNELL AVE. . DETROIT 10. MICHIGAN





## ...and GISHOLT SUPERFINISH

### breaks another cost barrier!

Do you think of SUPERFINISH as an expensive process? Then it's high time you know the facts.

Here's an excellent case in point ...on the record-breaking Douglas "Skyray." Among the most precise parts on this supersonic jet are the slide valves. They're ground from the solid, first on a cylindrical grinder, then on a centerless grinder. Then they're transferred to a Gisholt Superfinisher where

the bearing surfaces get a finish of 3 micro-inches, r.m.s. Former time for hand-lapping ran from 2½ to 3 hours per piece. The Gisholt SUPERFINISHER does it in 45 seconds! Think of it: less than 1/200th of the time! And think what that does to costs!

If SUPERFINISH can improve your product, as probably it can, better get the facts. Write for folder "Why SUPERFINISH?"



GISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.



GISHOLT

Madison 10, Wisconsin

Approximate diam. of slide valves (lower left) is ½" with reduced diam. of ½" between collars, or bearing surfaces. Parts are handled on the Gisholt Superfinisher in only 45 seconds per piece.

# Cincinnati Hydrospin Automatically Cold Spins Cones and Tubes

What is Hydrospinning?

Hydrospinning is a forming process in which a workpiece is forced to take the shape of a hardened, rotating mandrel. The workpiece revolves with the mandrel and the desired shape is spirally generated by one or two hardened and polished rollers which squeeze and stretch the workpiece around the rotating mandrel as the rollers traverse the mandrel's length.

#### Size of Machine

The standard Hydrospin machine, recently introduced by the Process Machinery Division of the Cincinnati Milling Machine Co., Cincinnati 9, Ohio, is built in a 42" x 50" size, in both plain and duplex models.

#### Capacity

It has the capacity to cold spin regular contoured hollow cones and tubes up to 42" diameter by 50" long. Roll force, which may result in unit presure as high as 400,000 psi, is sufficient to roll a 34" flat disk of AISI 4130 steel

down to a 60° included angle straightwall cone in one pass. Parts may be spun from flat disks, preformed blanks or rings of virtually any ductile metal. Mill-rolled sheet and plate stock, forgings and castings may all be used for Hydrospinning. Besides giving the part the desired shape, it often increases the tensile strength and hardness of the material and increases its resistance to fatigue failure.

#### Components

The machine consists primarily of a heavy, welded steel bed which rigidly supports the headstock, tailstock and the main slide units. A duplex machine has two main slides, while a plain machine has one. Tee slots in the bed permit universal positioning of the main slides which support the roller carriers. The hydraulically powered roller carriers are independently controlled and may be traversed simultaneously or individually, depending upon the spinning operation. By placing the slides parallel

to each other so that the rollers are opposed, tubes up to 42" may be formed. Cones of any included angle may also be formed—often in one pass. Dishing or beading operations on disk-shaped parts may also be done.

**Automatic Cycle** 

When production warrants, the machine may be set up to operate through a cycle in which the movements of the saddles, cross slides and tailstock and starting and stopping of the spindle are all automatically controlled. To facilitate setups, the machine may be operated manually by push buttons.

### Variable Speed Drive

Depending upon the spinning requirements, the Hydrospin may be equipped with a 50 to 60 hp infinitely variable

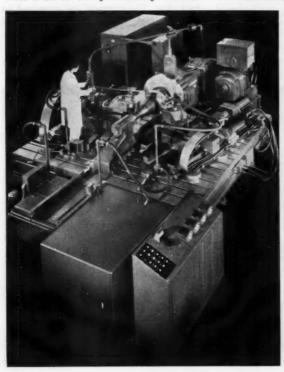
speed drive to the spindle, which is carried in tapered roller bearings designed to support both radial and thrust loads. High peripheral loads on the 36" diameter face plate may be supported through the use of an outboard roller mounted on the side of the headstock.

## Tailstock, Feed Rates Hydraulically Controlled

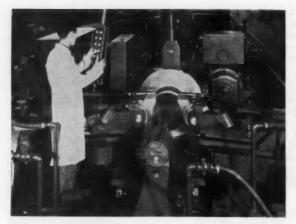
The tailstock, which holds the workpiece and mandrel rigidly on center, is hydraulically actuated. It may be positioned within 20" min. to 100" max. from the face plate. High capacity radial and thrust bearings are used in the tailstock unit.

Feed rates for both the saddle and cross slide are hydraulically controlled and infinitely variable. Two 7<sup>1/2</sup> hp

motors drive the hydraulic pumps which provide the power for these movements. Longitudinal feed rates are infinitely variable between 0 and 60 inches per minute when one slide is used and 0 to 30 inches per minute when both slides are used. Cross slide feed rates vary from 0 to 54 inches per minute using one slide and 0 to 27 inches per minute using both slides. Power rapid retraction is provided for the longitudinal slide. cross slide and tailstock.



Cincinnati 42"x50" Hydrospin has welded steel bed for support of heavy duty headstock, tailstock and universally adjustable main slides.

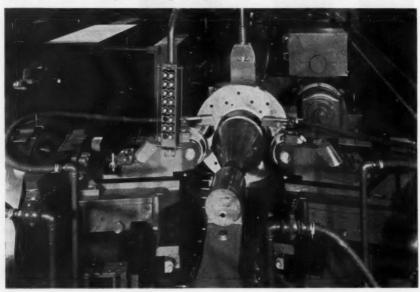


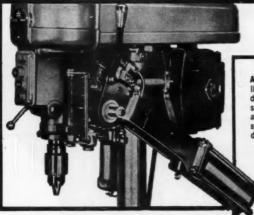
Machine may be manually controlled by push buttons, or set to operate through automatic Hydrospinning cycle. A 40 gpm system supplies coolant for flooding the work.

### **Tools Changed Easily**

The roller carriers are so designed that tools may be changed quickly and easily. Each roller carrier supports a roller, a set of roller bearings and a tool ring. The carriers are arranged so that the tools may be changed without disturbing the setting of the roller

Rollers retracted to show completed Hydrospun cone on mandrel. Roller carriers are so designed that tools may be quickly changed.



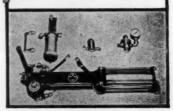


AT LEFT: ½" drill operates on 5 lbs. to 7 lbs. air pressure; ½" drill on 20 lbs. to 25 lbs. air pressure. Feed pressure at drill point averages 14x greater than air pressure, 1. e. air pressure at 20 psi delivers 280 psi at drill point.

BELOW: Major components of new W-T Air Feed. No "electrics". No "hydraulics". Installs in about 10 minutes, no machining necessary. Just connect to nearest air supply.



### AIR FEED DRILL PRESS



PAT. PENDING

# Ingenious Air Feed gives you AUTOMATIC CYCLING FOR PRODUCTION DRILLING — AT LOWEST POSSIBLE COST!

What does it cost? W-T Air Feed Drill Press is available at a surprisingly modest cost. For example: a W-T 15"-4" Travel Drill Press complete with motor and Air Feed is priced from \$344.00. You can get the Air Feed unit only at \$185.50 to fit your W-T Drill Press (or any W-T type drill press up to 6" spindle travel). Compare these prices!

Profitable? W-T Air Feed is 100% pneumatic . . . requires virtually no maintenance . . . gives you fully dependable low-cost, automatic performance for a wide range of production operations. Does not interfere with any function, swing or position of the machine.

Accurate? Air Feed control — including checking and slowing-down at several points and at the break-through point— is accomplished by ingenious micro-valve

action. By positioning a valve stop, spindle will feed and retard continuously and automatically. Accuracy holds within 0.003".

Available? Your Walker-Turner Distributor has W-T Drill Presses equipped with W-T Air Feed. You'll find him listed in your local telephone directory. Call him, today.

### WALKER-TURNER

· DIVISION ·

KEARNEY AND TRECKER CORPORATION PLAINFIELD, N. J.

DRILL PRESSES—Hand and Power Feed • AIR FEED DRILL PRESS ATTACHMENT • RADIAL DRILLS • Wood and Metal Cutting BAND SAWS • TILTING. ARBOR SAWS • RADIAL SAWS • JIG SAWS • LATHES • SPINDLE SHAPERS • JOINTERS • BELT AND DISC SURFACERS • FLEXIBLE SHAFT MACHINES bearings. Two swivel mounted carriers are supplied as standard equipment.

#### Attachments

With an hydraulic contour tracing attachment mounted on the cross slide, parts with curvilinear wall sections or multiple diameter tubes may be formed as well as parts having straight sides. A turning attachment is useful in development work for turning, facing and cut-off operations after Hydrospinning.

With a mandrel grinding attachment, which is equipped with Filmatic spindle bearings, forming mandrels can be finish ground on the face plate of the machine.

### Pack Your Bags!

The National Machine Tool Show will be located at the Amphitheatre, the Production Engineering Show, at Navy Pier, and the Coliseum Machinery Show, Coliseum, in Chicago, Sept. 6-17.



# BIG NEWS! FOR PUNCH PRESS USERS!

A complete NEW Line of Low Cost
benchmasters
with INCREASED TONNAGE!

Series 20 2 TON BENCHMASTER Series 70 5 TON Fixed Bed Gap Frame BENCHMASTER Series 50 5 TON BENCHMASTER Series 60 5 TON Deep Throat BENCHMASTER

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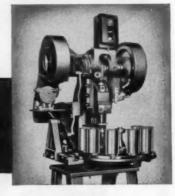
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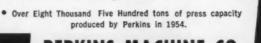


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MACHINE and TOOL BLUE BOOK

# Aluminum Plaster Casting Process Used in Many New Applications

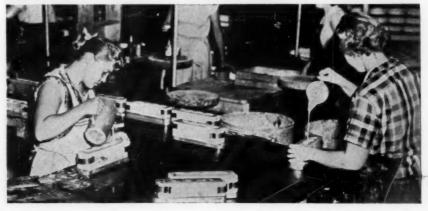
THE plaster process, first developed on a large scale by Aluminum Company of America as a core material for the intricate bladed castings used in automotive torque converters, is now employed in a wide variety of aluminum foundry applications.

The Alcoa Plaster Process has extended the design possibilities for aluminum and magnesium castings to alNew Permeable Plaster Molds Will:

- provide surface finish of 125 RMS
- general tolerances within .010
- reduces process time and cost

low production of parts in the foundry that were formerly impossible to produce. Plaster joins sand and iron (per-

One of the first applications of the newly perfected Plaster Process was the casting of the intricate bladed parts in automotive torque converters. Workers at Alcoa's Detroit Works are shown pouring plaster into core boxes to form the necessary plaster mold components.



manent mold) as a basic material in Alcoa foundries.

The use of plaster of paris for casting aluminum is nearly as old as aluminum itself. But heretofore its use has been limited by various factors including time and cost elements. Alcoa's new permeable plaster process reduced process time and cost, and thereby is opening many new fields of application.

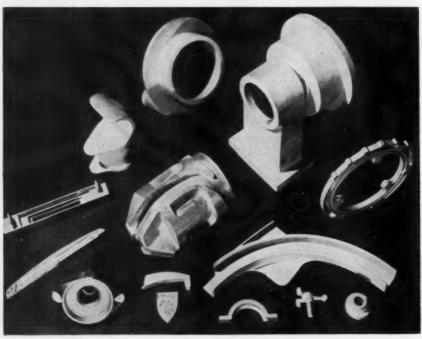
Permeable plaster molds allow the casting of aluminum parts with thin cross sections and with excellent surface smoothness. In addition, accurate dimensional tolerances can be met with

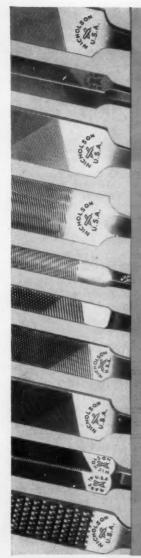
the process. The physical properties that can be achieved with permeable plaster are equal in most cases to those provided by aluminum sand castings.

Plaster mold components, already in extensive use for torque converter parts, offer other promising applications in the volume production of small castings, such as small bearings and building hardware parts. The process is not limited, however, to small parts.

These plaster mold components have been profitably used with sand or permanent mold materials to produce a composite mold casting. The plaster

Typical casting applications of the Alcoa Plaster Process are shown in this assortment of parts. Small castings such as those shown in the foreground are particularly attractive as cast with plaster. The size of these small parts can be judged by the Alcoa shield which is approximately two inches high. Alcoa's five foundries have recently been equipped to use the plaster process on a production basis.





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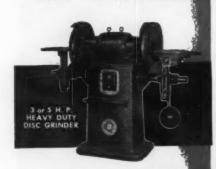
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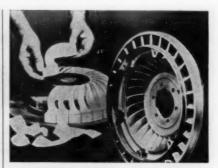


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The use of the Plaster Casting Process in the production of intricate automotive torque converter castings is demonstrated here. The plaster cores shown at left are used to form the blades on the casting on the right.

used in this combination allows the designer to specify surface and dimensional accuracy only where it is needed. The optimum use of the various mold materials will improve strength and often result in lower equipment and casting cost.

While the plaster process will not match fine machining tolerances, it is sufficiently accurate to avoid the machining that is often required with sand or permanent mold.

General tolerances possible with this new process are + or - .010 in. across the parting line for one inch or less. Between points produced in one part of the mold + or - .005 in. tolerance is possible. A nominal surface finish of 125 RMS or better can be achieved. Sharp corners can be cast where it is necessary.

The development of the permeable plaster process will be extremely important to aircraft designers. At the same time, Alcoa expects the process to have an important impact wherever engineered metal parts are used.

The End

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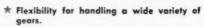
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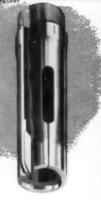
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Encircle No. 1D on Card, Opposite Page 65

# New Router Fixture Speeds Production More Than 100%

By Fred M. Burt

- · eliminates hand filing
- · all jobs done by milling
- 3 fixture lengths handle all extrusions
- average of 3" milled off each extrusion

NORTHROP Aircraft, Inc., has eliminated the need for hand-filing extrusions used in airframe construction through the use of a new precision made router fixture.

In machining the considerable quantities of T-shaped aluminum alloy (75 ST) extrusions used in airframe construction, it has been necessary to do a lot of hand filing. In some instances the vertical leg must be removed as several scallop cuts are required, as in Figure 1.

Previously three cuts were made with the router cutter, one on each side and one for the base. As the tolerances on the base run as close as minus 0, plus .0010", these oversize cuts were made leaving about .05", followed by a long careful job of hand filing to come within the specified tolerances.



Figure 1. With the two sections of the adapter attached to the inner faces of the Onsrud Router's vise jaws, a T-shaped aluminum alloy extrusion is held in exact position for precision machining to extremely close tolerances with radiused end mills, or cutters with degree'd edges for scallop cuts. The 36" long x 1" square steel bar in rear is used for attachment of stops to position extrusion for successive millings; the stops are hinged so they can be thrown back out of the way without detaching. In this set-up the 16" fixture is in use by Dave Adams, the leadman who designed the fixture.

Figure 2. This drawing gives further detail on the router holding fixture.

#### ADAPTER SECTION

Two of these with identical dimensions, are attached to the inside faces of the Onsrud Router vise jaws. They are machined to close tolerances.

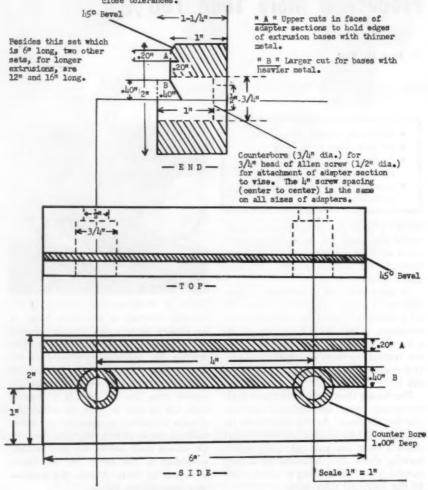




Figure 3. By adapting an Onsrud router motor to a special holding rack, Northrop Aircraft has been able to introduce an operation that trims the flanges of all formed half ducts to exactly one-eighth inch in preparation for welding, where formerly it was necessary to scribe the parts to a trim template and then saw, trim and hand file to the required dimensions. The machine was designed by Art Dietrich, (shown in Photo), a leadman in Northrop's welding shop, The machine is used for trimming all of the ducts for the new Air Force all-weather interceptor, the Scorpion F-89. By use of the machine, 120 inches of half ducts can be trimmed each minute. Formerly, two inches were trimmed in the same time. A special air hose attachment blows the chips away as the half ducts are trimmed, and simultaneously a regulator blows oil onto the cutter. The router motor operates at 38,000 rpm.

With this new precision made fixture all of the jobs are done by milling, eliminating more hand filing. Three



Figure 4. Side view of Onsrud Router attachment.

lengths of fixtures, 6", 12" and 16" handle all of the extrusions. This is an extract from the report that won a suggestion award for leadman Dave Adams: "On the Scorpion F-89, there are approximately 100 extrusions which have to be milled. These vary in amount of milling, but on the average it is necessary to mill three inches off the leg of each extrusion. It was estimated that it takes at least .300 hours for the hand work on each of these parts (an average), or 30 hours total for each plane. Time studies of the new setup's operation revealed that it requires an average of .0255 hrs. to work each part; completing the precision machining with end mills, and eliminating all hand work."

The holding fixture has two identically machined adapter sections which are attached to the inside faces of the Onsrud router's vise jaws.

The End.

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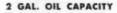
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# Machining Aluminum With Automatic Screw Machines

Problems and Answers For:

- · machining tools
- · types of tools used
- · high-speed steel tools
- · cemented carbide cutters
- · tool angles

THE IMPORTANCE of automatic screw machines in converting rod and bar stock into finished and semi-finished aluminum parts cannot be overemphasized. An almost countless variety of products and components are produced annually on these important machine tools.

In addition to the different types of parts which can be made on screw machines, the number of operations which are regularly performed on a single piece is unusually important. Bar stock may be turned in the conventional manner, but more significant, operations can be performed simultaneously as well as progressively by subdividing the cutter function.

The screw machine in many respects is similar to the turret lathe in the

operations performed. The two differ in that the screw machine always has an automatic cycle which sets it apart in the field of turning. It should be realized that the name "automatic screw machine" tends to limit this versatile tool to the production of screw products commonly associated with fasteners. This, however, is denied both in operational functions and in parts produced. A more suitable name would be "automatic bar machine," and even this does not include chucking work which can also be handled on automatics.

The purpose of the automatic screw machine in modern metalworking is to produce identical parts continuously with minimum operator attention. Ordinarily, long work runs are associated with automatic screw machines, but where tooling warrants and is not excessive in cost, short runs may be practical.

This article is offered not as the ultimate criteria in machining, but rather as helpful suggestions to indicate solutions for individual problems.

Various manufacturers of automatic screw machines, as well as companies producing aluminum parts, have their

This article is an abstract from a book entitled "Machining Kaiser Aluminum." which is soon to be released by Kaiser Aluminum & Chemical Sales, Inc., Technical Publications Dept., 919 N. Michigan Ave., Chicago, Ill.

#### CAM DESIGN WORK SHEET

PART NAME OR NO Example 1		MATERIAL . Aluminum					
		SURFACE F	EET FOI	R STOCK			
		8.6	4.6	THREAD			
		6.6	66	DRILL			
		64	46.	TURN			
	SPINDLE						
	R.P.M.	BACKWAR	D				
		SECONDS	30				
		GROSS PRO	DUCTIO	N PER HOUR 120			
		MADE ON.	No. 2				

				Spi	ndle R	evoluti	ons		Hund	lredths
Order of Operations	Throw	Feed	Foreach	Operation	After Deducting for	Operations	Readjusted to Equal	Change Gears	For Spindle Revolutions in Preceding Column	For Operations That are Overlapped
Feed Stock to Stop	1.500 .182 .010	.010 .010 .003 .001		150 150 60 18		24 24 150 24 150		24 24 150 24 150 24	25 4 25 4	3 10 3 16
Cut Off — Back Slide	-	.0033		175		175 547 570		600	100	

Note.—A dimensioned pencil sketch of the piece is often drawn in blank space at top of this sheet.

2-1/2" Cleveland AB Single Housing	Spindle MacH. TIME 3-1000-1 MIN. SEC. 77 PER H	in. Gres
MAYERRAL 2024 Aluminum Bar Stock  SPHINGE SPEED 799 M. P. M.  SURPACE PERV. 118 on 2" dia.	2" Rd,	
ROTATING DRILL P.P.M. PEED & P.P.M. THREADING 1. P.P.M. THREADING 2. P.P.		
POSITIONS & OPERATIONS	TOOLING EQUIPMENT	COST
1 - Gage  2 - 2-step drill 7/8" & 1-21/32" dias. Face & form 1.918, 1.260 & 1.918 dia. on rear of piece past cut-off (Front slide)  3 - Counterbore & radius 1.685 dia. & counterbore and chanfer 1.718 dia.  4 - Recess to 1.810 dia. (Bumper on rear slide)  5 - Counterbore 1.110 dia. hole past cut-off and form 1.630 & 1.300 dias. & form & chamfer 1.375 dia. & breakdown for cut-off  Cut-off with independent cut-off attachment on return stroke of turret	1 - K-28 adjustable gage stop  1 - K-610 master drill nolder and bushing  1 - H.S.S. two step drill  1 - Special wide Dovetail tool post (front)  1 - H.S.S. Dovetail form tool  1 - Special front slide cam  1 - K-681 adjustable counterbore holder  1 - H.S.S. counterbore & chamfer tool  1 - K-65 recessing tool holder & bumper block  1 - H.S.S. circular tool bar & tool  1 - K-681 adjustable counterbore holder  1 - H.S.S. h fluted straight shank drill  1.120" dta.  1 - K-48 (Std hl253) single support circular tool post (rear)  1 - H.S.S. circular form & breakdown tool  1 - Independent cut-off attachment with holder and blade  1 - Set 2" Rd. chuck pads, feed shell pads and bushings  1 - Special rear slide cam	

Figure 2—Simplified Work Sheet

own work sheets or estimate forms. The purpose of such records is to clarify all operations placing them in a logical sequence to take advantage of time, machine features, and tooling setup. With work sheets correctly drawn up, there should be a minimum of trouble experienced in producing the part as visualized by the estimating engineer. It is only when some factor is overlooked or omitted that trouble occurs. The work sheet tends to eliminate such shortcomings. A typical work sheet is shown in figure 1. This particular study is closely associated with cam design. A less formal estimate sheet is indicated in figure 2. Other types are shown in figures 3 and 4. All such work sheets are effectively used by individual companies according to their needs.

Pertinent information from such records together with prints is usually furnished the setup man for reference when setting up the job. Should tooling changes be made at the machine for more effective production, engineering drawings should carry a complete record of such changes. This procedure eliminates depending upon the memory of the operator or setup man if the same job is run again at a later date.

Undoubtedly, other factors common to individual plants may be added to the foregoing work sheets to insure positive check when estimating automatic screw machine jobs. The adaptation of a systematic plan in handling all jobs with a written record of machine results will eliminate many errors and, at the same time, will point the way to greater profits.

#### **Machine Tooling**

Considerable information has been

and continues to be published on tooling automatic screw machines for working ferrous metals. Ample data for the machining of aluminum has neither been correlated nor offered in printed form. The rapidly increasing use of aluminum in many screw product applications indicates the broad and urgent need for more information on this subject. In the following pages, material concerned with the tooling of automatic screw machines is presented to help persons in the screw machine products industry with everyday production problems. The type of tools to use, figure 5, the angles of cutters, and the speeds and feeds shown are those which have proven effective in the field.

The variation of individual jobs performed on automatic screw machines makes specific recommendations for individual tooling setups impractical. What may prove to be satisfactory tooling in one shop may not meet the requirements of another. It is only through the presentation of successful tooling practices and the ideas they suggest to the reader, that progress can be made in machining aluminum on automatics. Consideration is also given to coolants for the important part they play in automatic machining practices.

It must be realized that such information is presented for its worth in relationship to the individual's knowledge and experience in similar work. Slight modifications and changes of recommendations to meet specific problems must be recognized. The progressive manufacturer will keep a record of any variables thus coming closer to practical requirements when machining all types of aluminum alloys.

PAS	п но. #А-23117	PART NAME CUR	LEK KUD.			NO. SHEET	3	SHEET PA	0. 4	
Lope	GORMAC PROD	UCTS, INC.		Deter						
-	use given below one appear, dr I as a basis for obtaining the se faction.			REMARKS	k					
	PART DATA		ACTUAL	CAM DATA						
Mate	erial .	2011-73	ALUM.	Rocker 3cl Ctr.					-	
	, P. M.	1025		3-4 21			I Dulli I Tap I Index - O			
	I, M. of Spindle of Rev. for each Place	9000	-							
	or Por. Min.	5.0	1			Index - I				
	no Hourly Frad.	300 Gres		Ratios es marked						
	SEQUENCE OF OPER	ATIONS	Food	Bas's'	Tool Traval	Spindle Traval	Pred. Day	Dog.	Pro Do	
1	OUT #3-DRILL IN	POSITION					-	5	5	
2	SAFETY				-		-	2	7	
3	DRILL STEP HOLE		.003	167		-500	34	-	AT	
4	SAFETY						-	2	43	
9	OUT DRILL TO CLEAR					.500		6	49	
	IN #2 TO POSITION				.017				49	
7	SAPETY							2	SI	
	GENERATE #2 FIRST SECTION		.005	204	.190	1.016	40		91	
0	TURN #2 OM .120		.005	188		-937	38		129	
	ENURL #5 FOLLOWING & OUT.								129	
11	GENERATE #2 ON		TON	220	207	I.096	44		173	
12			1		-	24.70	1		17	
13	TURN #4 ON .382D.							2	17	
-	SAFETY 40 DO STOR AS		0075	85	***		17	12	19:	
14	PLUNGE #3 TO .214D-OUT #2		*4413	0.7	-134		17	1 2	19	
15	SAPETY							2	1	
16	TURN #3 ON .214D		IOO	159	-	.159	32	-	22	
17	GENERATE CUTOFF #3		.0005	264	.132	.107	52	1	271	
18	OPEN COLLET				-		-	IO	28	
10	RETRACT HEADSTO	CK					-	55	343	
20	CLOSE COLLET				-			17	360	
	TOTALS			1287	REVS	PER DEG.	257	103	360	

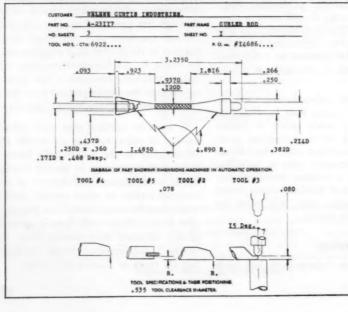


Figure 3— Work Sheet With Part Drawing

#### Types of Tools Used

The characteristics of automatic screw machines demand that a variety of different tools be employed to complete a machining cycle. The ultimate economy of using automatics largely depends upon full tooling. Idle stations increase the time needed to produce a given part. Consequently, it is important to take full advantage of machine potential in tooling. Some of the more common tools used in production on automatic screw machines are:

Box tools Drills Counterbores Flat form tools Facing tools Knee tools Reamers Tapping tools Threading dies Recessing tools Shaving tools Skive tools Improvised tools Dove tail form tools
Cut-off tools
Circular form tools
Boring tools
Knurling tools
Hollow mills
Swing tools
Pointing tools
Taper cutting box tools
Swaging tools
Broaching tools
Thread rolling tools
Marking tools

To this list must be added machine accessory equipment and attachments. Included are such components as tool holders, back rests, guides, bushings, stops, and similar units. When standard and special devices are used, it is often possible to complete operations on the automatic which ordinarily would be handled on secondary machines.

Many shops also rely upon improvised tooling to solve unusual or unique machining problems. Such tools are developed for urgent or temporary needs. Because their origin depends upon the skill of the tool designer, or possibly the setup man or machine operator, they cannot be considered as standard equipment. Nor is it practical to attempt a description of the many types which may be made and used.

#### **High Speed Steel Tools**

At the present time, all types of cutting tools used on automatic screw machines are predominantly made from high-speed steel. Production requirements in most instances can be met with such tools. Yet, there have been definite advances made in machining aluminum which have and will continue to focus greater attention on the carbide group of cutting tools. Competent fabricators of screw machine products are keeping abreast of the several developments in the field of tipped and solid carbide cutters.

High-speed steel tools include the tungsten-chromium and vanadium alloys, the molybdenum-tungsten types, and the cobalt high-speed steels. A few carbon steel tools are used especially where small drills and taps are subject to a high percentage of breakage. Yet, actual field studies indicate that small carbide drills are being used to better advantage even in such cases. Tooling automatics is unusually flexible and the ingenuity of the tool designer, coupled with the proper choice of cutters and cutter materials, often determines the success or failure of a job.

When high-speed steel tools are employed to machine aluminum, considerable attention must be paid to grinding cutting angles, clearances, and final tool finish. Too often, it is assumed that a cutter should work satisfactorily even when ground by "rule of thumb" practices, Much trouble can be eliminated by discarding all such practices, then centering attention on a systematic study to obtain optimum cutting angles for the various aluminum alloys. Once such angles are established, based, of course, upon what others have found satisfactory, new and better aluminum

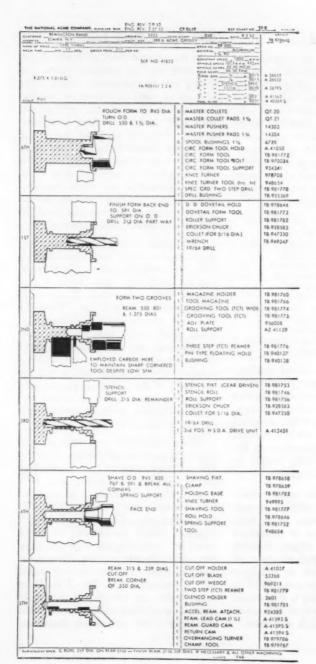


Figure 4 — Detailed Work Sheet Showing Tooling operational sequence, and other applicable data.

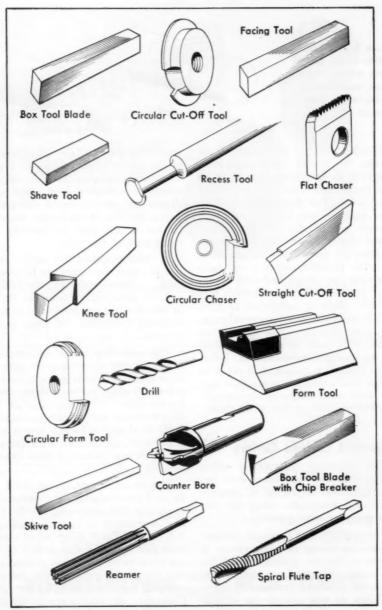
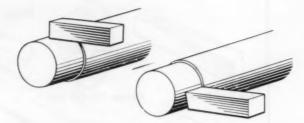


Figure 5—Cutting tools and Blades Commonly used on automatic screw machines.

Figure 6 — Tangent cutting tool on automatic screw machine (top). Radial cutting tool on lathe (bottom).



machining practices will result. In addition, the overall finish of cutters should be the scrupulous concern of the tool inspector. Numerous case studies have proven that highly polished surfaces, such as flutes in drills, taps, and reamers aid in chip movement and retard edge build-up. Also, where chip breakers are ground into cutting tools, smoothly polished contours will help determine the shape and size of the chip. Further, it has been proven that a slight offset or roughness in such surface will cause build-up, metal packing, and ultimately tool damage or breakage. It should be emphasized that, in machining aluminum, the better finish applied to a cutter will result in higher production, less down time, and less tool cost. High finish assumes mirror-like surfaces to micro-dimensional smoothness.

#### **Cemented Carbide Cutters**

The preceding information offers pertinent data on high-speed steel cutters. It is also important to consider machining aluminum using the carbide group of cutting tools.

The application of cemented carbides to the machining of aluminum is unique in that the optimum speeds for machining this metal are not usually attainable. Present automatic screw machines do not provide the spindle speeds necessary to take full advantage of the cutting characteristics of aluminum with carbides. Should machine speeds be sufficiently high, other conditions may preclude use of such speeds due to the size of workpiece, shape or balance of the part, or possibly the fragileness of the piece.

In most instances, the surface foot rate at which aluminum can be turned, faced, or bored with tungsten carbide tools is unlimited.\* Minimum speeds of 500 sfpm are acceptable and in light finishing operations, 800 sfpm is not excessive.

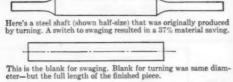
The preceding speed recommendations are for aluminum in general. More specifically with regard to various aluminum alloys, as the hardness, workhardenability, or abrasiveness of the alloy increases, lower speeds and heavier feeds are desirable. Higher speeds and, if necessary, higher feeds are applicable for alloys not possessing these characteristics.

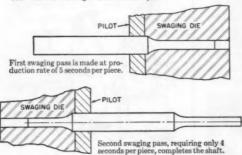
The recommendation for feeds to be used when machining aluminum is much like that concerning speeds. The feed rate can be as high as conditions will permit. For a given set of conditions and a specific alloy, a feed rate—not equal to the maximum attainable—may provide optimum tool life, but this can only be determined "on the job." Generally, an inclination towards

<sup>\*</sup>Machining Aluminum, Special Report by D. G. Jones, Kennametal, Inc.



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heavier feeds will be found most practical.

There are a number of commercial carbide-tipped tools offered for the machining of aluminum. The following comparison chart shows some different types of manufacturers' trade names. All are suitable for the operations indicated.

	Carboloy		Firthite	Talide
Roughing	44A	metal K6	н	C89
General Purp.	. 883	K6	HA	C91
Light Finish.	905	K8	HF	C93
Precision Bor	. 999	K8	HF	C93

**Tool Angles** 

The optimum cutting tool angles and their affect upon machining aluminum on automatics are but generally known. While it is true there are many angle values being satisfactorily used, based upon the alloy, chip formation, and speed range of standard automatic screw machines, there is variance as to the ultimate effective tool angle for high-speed cutting operations.

Generally, the tools employed on

automatic machines, especially bladetype units, are arranged for tangent cutting. Lathe tools differ in that they are mounted for radial cutting, see figure 6. With single point tools, the cutting angle, back rake, side rake, and front and side clearance are all ground into the tool. This is necessary because of the cutting action that takes place. With conventional box tools, balanced turning tools, and knee tools for automatic screw machines, tangential cutting simplifies tool geometry. Insofar as geometry largely depends upon selected tool angles, it is important to indicate the angles employed on several types of tools. The values presented have been carefully considered and when used, will provide the tool with basic requirements for satisfactory cutting. In presenting the tool drawings, only representative units are shown. However, it is possible to interpolate the angles indicated for a broader group of tools and their geometry.

. The End

#### War Controls Opposed

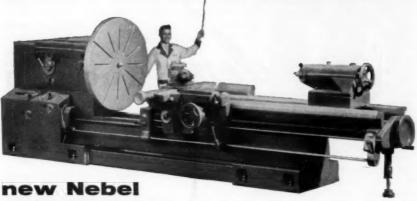
The controversial issue of controls will come up shortly. An effort will be made to control the entire economy—prices, wages, credit rationing—to become effective in the event of war. The trouble is if the controls are voted now they may be invoked at any and all times. For this reason many are opposed.

The National Association of Manufacturers recently appeared before the Sub-Committee on Small Business of the Senate Banking and Currency Committee and urged that the Small Business Administration be abandoned, that all its functions, including its authority to make loans, be transferred to the Department of Commerce.



"You bet we attended to plenty of serious business at the machinist's convention, dear! Why are you staring at me like that?"

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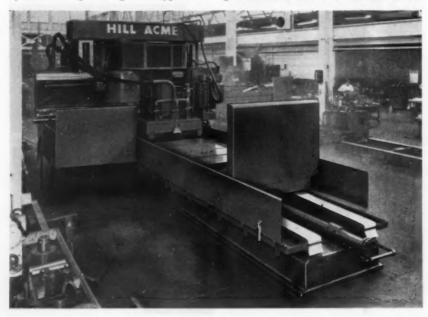


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#### World's Biggest Vertical Spindle Surface Grinder

The Hill Acme Co., Dept. MTB, 1201 W. 65th St., Cleveland, Ohio, has recently completed the "world's biggest" hydraulic reciprocating table type vertical spindle surface grinder for heavy stock removal on die blocks or steel plates up to 54" wide x 144" long. This grinder is claimed to eliminate the



necessity of planing operations prior to final grinding by producing ground finish surfaces from the rough rolled plate, or forged die block.

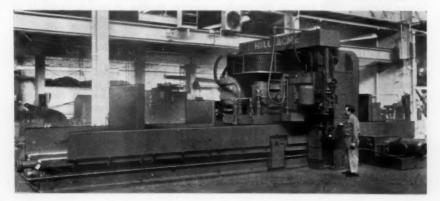
All parts of this double housing grinder are made extra heavy and rugged to withstand the load generated by heavy grinding pressures with a 42" diameter segmental grinding wheel driven by a 125 hp TEFC V-belt main drive motor. The final flat grinding operation to precision tolerances and fine surface finish are likewise accomplished with the segmental grinding wheel.

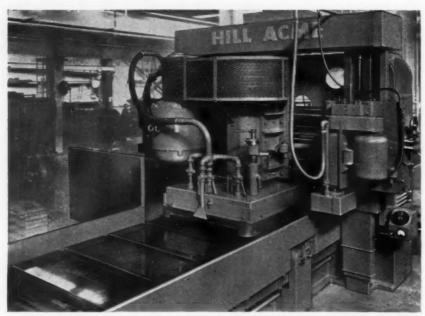
The entire large grinding wheel head travels hydraulically across the table, for two specific reasons: (1) When using the large grinding wheel the head is reciprocated on the cross rail by means of its own hydraulic pump, valves and cylinder so that the 42" diameter grinding wheel will cover the maximum working surface of 54". (2) For certain grinding operations an auxiliary grinding head powered with a 10 hp motor is used. In this case the large grinding head is moved to the back of the machine, thus permitting the auxiliary grinding head to cover the entire width of the table.

The smaller auxiliary grinding head can be moved manually or hydraulically in a horizontal direction — the manual movement being used for final positioning, the hydraulic movement for initial positioning. The auxiliary grinding head is also equipped with manual vertical movement for fine feeding or to permit grinding of shoulders or posts with the side of the grinding wheel. This head can be provided with a 12" diameter (maximum) cup type grinding wheel for precision finish operations.

The 48" x 144" semi steel table is reciprocated by two opposed bronze lined cylinders and steel pistons with the hydraulic oil pressure sealed by Chevron type packing. The low pressure hydraulic system is complete with a 20 hp hydraulic pump motor coupled to a large capacity hydraulic pump, together with the necessary flow control valve to regulate the table speed, also directional valves and solenoid operated start-stop valves.

Grinder is equipped with two motors for the vertical movement of the entire cross-rail and grinding heads. A 3 hp constant speed motor connected through a gear box to the elevating screws raises and lowers the rail and grinding head at approximately 5" per minute and is used for initial positioning of the grinding wheel over the work to be processed. The second motor, a





1 hp gear head motor connected to the elevating screws through the common gear box and a magnetic clutch is used for the final positioning of the crossrail and feeding the large vertical spindle grinding head into the work. Precision feeding within .00025" is accomplished. A large indicator directly above the feed lever records the depth of cut being taken in thousandths of

an inch and a percent of load meter in the same area indicates the grinding load on the 125 hp main drive motor. The massive cross-rail is claimed to insure rigidity and permanent accuracy.

Vertical grinders can be furnished in 48", 60" and 72" table widths and in varying lengths. It is also available in horizontal spindle design.

#### Worn Valve Plugs Reclaimed by Metallizing

The reclamation department at the Standard Oil Company of California plant in La Habra handles all of the repair work for their operation in South California. The repair of valves comprises the greater part of the reclamation work. Metallizing has solved some of their problems, and promises savings of thousands of dollars every year.

The reclamation department handles up to 5000 valves yearly. Most of them

require reconditioning. During pumping operations they handle water, sand and oil. In the refineries they must control gasoline, oil, grease and other chemicals. The net result of all these factors is a rough combination of abrasion and corrosion. Hard stainless steel has given the plugs a greater life than before. It resists the corrosive action of the chemicals and is much tougher in contact with the mud and sand



#### TAFT-PEIRCE Relies on Sentry

At the Taft-Peirce Manufacturing Co. in Woonsocket, R. I., they rely on Sentry for accurate, dayafter-day performance in the heat treating of such items as these thread plug gages. In addition, all types of high speed steel cutting tools are treated with complete freedom from decarburization.

If your Heat Treating Department treats any tools made from high speed or air hardening steels—and is troubled by surface deterioration, decarburization or scale—investigate Sentry. The Diamond Block Method of atmospheric control has been proved over and over as reliable, economical, and consistently effective.





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pumped up during the drilling.

A 10 inch plug is metal sprayed in two hours. It would take the welder two days to do the same job. With metallizing little excess metal is needed for finishing. This appreciably reduces grinding time. Metallizing Engineering Co., Inc., Dept. BB, Westbury, N.Y.

#### Production Up, Costs Down with Carbide Insert Tooling

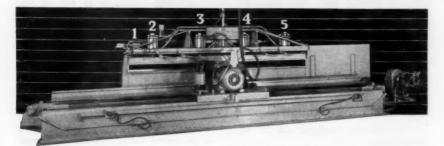
By switching to carbide insert-type holders at two stations on rough and finish machining operations of tractor final drive pinion bearing cages, a midwestern road machinery builder recently jumped production from 40 to an average of 400 pieces per grind and reduced tool cost per piece from \$.019 to \$.0034.

All rough and finish turning, facing, boring and chamfering of the bearing cages are performed on a 25 hp two spindle Potter & Johnson automatic turret lathe in five operations with two bearing cages being machined per setup. The new insert-type tcoling employed

on four positions at stations No. 2 and No. 4, as well as the brazed-type single point tools being used on all other positions, all supplied by Wesson Company, Detroit, Mich., are utilizing Wessonmetal carbide inserts and tips, Grade GS for roughing and Grade GI for finishing.

At station No. 1, Wessonmetal-tipped flat tools, mounted on the turret, rough bore two diameters and rough turn the body diameter on both cages. Average depth of cut for all roughing operations is \%". All roughing and finishing operations are being done in three feeds—.008", .012" and .018". Speeds employed

# 5 NOPAK Cylinders supply pressure and pull



#### for important functions of Victor Veneer Jointer

The Victor Straight-Line Veneer Jointer, built by the E. V. Prentice Co., Portland, Ore., employs a NOPAK Model E 2½" x 6" Cylinder to operate the stops which align the stock, and 4 NOPAK Model D, 6" x 5" Cylinders to exert adequate, equalized clamping pressure on the full length of the stock to be joined. All cylinders are controlled from a single station to provide for fast precision alignment and clamping in a rapid, repetitive work cycle.

This is another example of the important role played by NOPAK Cylinders and Valves in actuating and controlling precision machine movements. Others are shown in the NOPAK Application Manual. Ask your NOPAK Representative to show you this helpful book.

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Pieces per grind jumped from 40 to 400 on this tractor bearing cage machining operation as result of switching to solid carbide insert holders.

are 220 sfm for roughing and 380 sfm for finishing.

At the next station, tipped flat tools mounted on the turret rough face the bottom of the bore and rough face the flange of cage mounted on spindle No. 2. Simultaneously a new offset Multicut holder mounted on the front cross slide rough faces the flange of the bearing cage on spindle No. 1.

Turret tools semi-finish turn the cage diameters and semi-finish bore one internal diameter on both cages at station No. 3. The 5\%" internal diameter is also finish bored at this station.

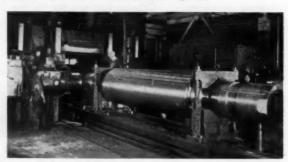
At station No. 4, flat tools mounted on the turret finish face the bottom of the bore and the flange is finish faced on cage No. 1 with a Multicut holder. At the same time, another Multicut mounted on the rear cross slide advances 2¾" and finish faces the flange on cage No. 2.

The outside diameters are finish turned on both cages at the final station. The larger internal diameter which was semi-finished at station three is finish bored with brazed-type flat tools mounted on the turret, completing all operations.

#### Universal Milling Machine with 22" Diameter Quills

A universal milling machine with double-head 22" diameter quills is now being used by the Rolls division of the Blaw-Knox, Pittsburgh. Shown here the machine is milling flat couplings on a cast 36x120 plate mill roll. In order for the roll to drive perfectly and maintain gauge of material being rolled, the flats must be abso-

lutely parallel and equidistant from the roll axis. The machine will also mill

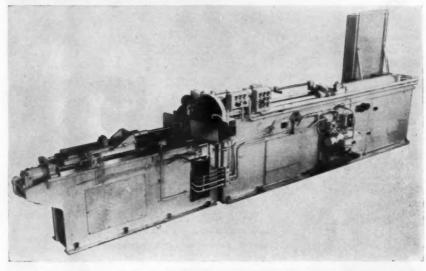


keyways, splines and locker holes.



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#### Automatic Horizontal Broaching Machine Broaches ID of Laminated Rotors



This American automatic horizontal broaching machine with electrical controls broaches the id of laminated rotors for electric motors. Designed to fit in a conveyor line, the machine automatically positions, clamps, broaches, and ejects the rotors one at a time.

A sliding fixture with automatic split vees is used to position and clamp the part. These vees retract individually to accept parts from the conveyor line and eject them after broaching. An automatic broach carrier and clamp mechanism interlocked to the machine cycle carries the broach forward through the part until it connects with the broach pull head. A hollow clamp nose on the carrier slides the fixture forward, seating it, and then clamps within the flanged rim of the part. Following the broaching stroke, a drag link in the carrier returns the fixture to alignment with the chute, allowing the part to be ejected. A step cycle then moves

the carrier forward to pick up the broach and return it to starting position.

A universal chute, which can be adjusted in size to accommodate several different rotors, feeds the parts to the fixture. Retracting jacks in the chute are used to hold and release the parts one at a time. Operation of the cycle is completely automatic. The machine continues to cycle as long as parts coming in actuate the electrical interlocks. American Broach & Machine Co., Dept. B, 415 W. Huron St., Ann Arbor, Mich.

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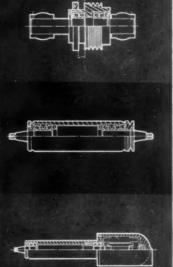
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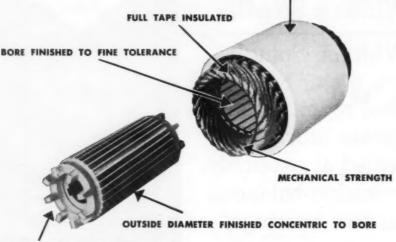
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MACHINE and TOOL BLUE BOOK

# Shop HINTS

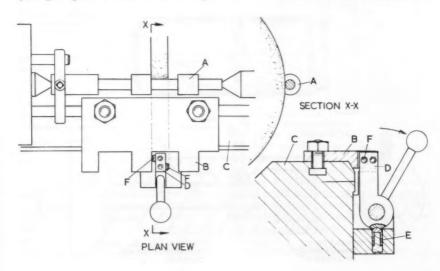


## **Precise Length Grinding**

By C. T. Bower

UNLESS some means are provided for spacing the shoulders on a component during finish grinding, the operation can degenerate into a slow process of cutting and trying. A typical component requiring precise control over the spacing of ground faces is the average

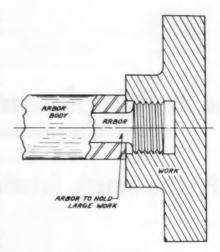
pilot or control valve used in hydraulic servo mechanisms and control gear, an example of which is shown mounted between the centers of a universal grinding machine at A. On this piece of work, it is necessary to space out the faces within a total tolerance of



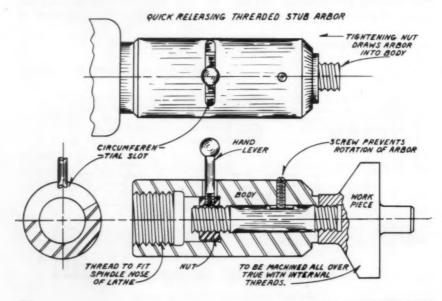
0.001" so a system of positive stops for positioning the traversing table has been adopted.

The stop plate B has shoulders machined in it and their positions duplicate exactly the face positions required on the finished component. The plate is bolted firmly to the top surface of the machine table C.

A retractable gage is fixed firmly to the front face of the machine base casting. It comprises a vertically positioned steel bar D which is pivoted at its lower end. The bar can be retracted clear of the stop plate gaps by operation of the ball ended lever; it is retained in the upper and operating position by the spring-loaded plunger E engaging with a dimple. The gage is retractable to allow the table to be moved along so that the gage can fit into another slot in the stop plate.



Gage is adjustable for width. As the grinding wheel width is reduced by constant dressing with the diamond, so the gage is reduced in width to correspond with it. The new wheel width



is measured by means of a micrometer and the horizontal stop screws F forming the gage are adjusted to match it. During resetting of the stop, it is necessary to grind to length one of the gaps in the component to a suitable gage and to set the corresponding gage screw to suit each side of the wheel position on the component. As only 0.003" is left for finish grinding the faces on the work, a considerable number of pieces can be produced for each wheel dressing.

The stop plate position requires that the unground components be positioned in an accurate axial position between the lathe centers. The center holes in the components have an effect on this; if the center hole is deep at the head-stock end, the component will be too far to the left and if it is too shallow it will be out of position in the opposite direction. It is essential that the center holes when first drilled in the component be arranged so that the center points on each one are the same distance apart.

The turning operation for roughing out the valves insures that the shoulders are placed correctly in relation to the center holes. Duplicate center drilling is essential in all cases where the grinder table is working to fixed stops for the precise location of ground shoulders.

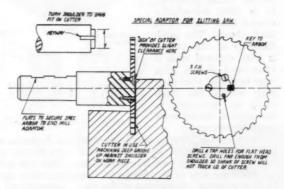
### Special Adaptor for Slitting Saw

By Henry Reber

It is sometimes necessary to cut a deep slot close to a high protruding shoulder. The conventional arbor mounting of a slitting saw for this work will not be possible due to interference of the protrusion and the milling machine arbor. A standard stub arbor will not do the job because of interference from the nut on the end of the arbor. The illustration shows a job of

this sort and the arbor designed to drive the cutter. The simple shop-made arbor will allow the side of the cutter to fit flush against the shoulder of the work.

To make this arbor you simply turn up a piece of cold finished mild steel to fit a standard end mill adaptor. The body of the arbor should be as heavy as possible to give maximum support. A keyway is milled into the shouldered



end of the arbor to key the cutter. This shoulder should be a snug fit into the hole in the cutter.

The shouldered end is drilled and tapped for three flat head machine screws. These holes should be placed far enough from the od of the shoulder for strength but close enough to allow the head of the screw to seat down onto the cutter.

The countersinking of the arbor and

cutter is done on assembly and can be done freehand with a high speed hand grinder and a mounted point grinding wheel dressed to the screw head angle. The screws can be seated just flush with the surface of the cutter. There will be no danger from these screw heads rubbing on the surface of the work because the dish angle of the cutter

will allow at least a few thousandths clearance.

The key will do the driving and the screws serve only to hold the cutter in axial position on the arbor. Flats should be milled into the shank of the arbor to secure it tightly in the end mill adaptor.

### **Emergency Thread Snap Gage**

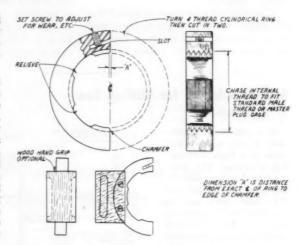
By Everett Snyder

A temporary thread snap gage can be quickly made of soft steel according to the accompanying design.

A piece of round steel bar stock is chucked in a lathe and bored to correct minor diameter. It is then carefully chased with the correct pitch thread. The pitch diameter of this thread is best checked with a standard thread plug gage or a mild steel plug gage which has been made up according to the correct thread wire measurements.

The threaded ring is next removed from the chuck and sawed or milled into two pieces. This cut line should be on the large side of the diametral line so that eventual chamfering of the exposed thread ends will bring the initial contact point exactly on the diametral line of the completed snap gage.

The threads are removed at the two positions shown in the sketch so that the gage will contact only at two opposed ends of the opening. The small threaded portion left on the back inside of the gage acts as a back stop to indicate when the gage has been pushed to correct measuring position.



A slot is cut into the gage at the top, as shown, to form an adjusting leaf. This leaf is forced down by a set screw to either set the gage to correct measurement or to compensate for wear.

The gage may be provided with a wooden handle, as shown, to facilitate handling and also to prevent thermal changes due to handling.

This gage has proven to be efficient and economical for short run work. It is, however, very important that frequent checks be made with the master plug gage to detect and correct for wear.

The End



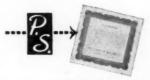
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Check your figures . . . the total may surprise you.

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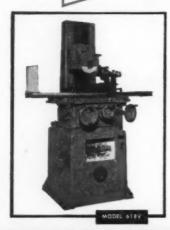
. THREAD TOOL DIV.

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ACCURACY



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You, too, can have the precision, the better surface finishes, the dependability and convenience of operation that are engineered into every Reid Grinder. So why not plan now to replace the over-age surface grinders in your plant with new Reid Grinders.

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# vour best bet... **BS**

single spindle automatic screw machines

for fast, economical single spindle bar work up to 2" diameter

BSA Tools Ltd. of England, one of the world's oldest and largest machine tool builders. have produced and distributed thousands of these BSA "Singles" since they introduced them in 1926.

Available in five standard capacities: 1/2", 3/4", 1", 1%", and 2".

All models use STANDARD AMERICAN TOOLING.

Wide range of spindle speeds -200 to 6000 on 1/2" mgchine, 69 to 1260 on 2" model.

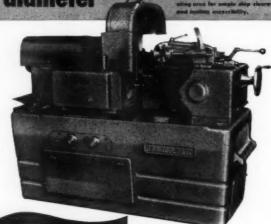
Cams, change gears and tooling easily accessible for quick job-to-job changeover.

Unit construction provides quick access for easy main-

Special spindle mounting, designed to reduce wear.

Cross slides and turret mounted on replaceable ways.

Positive chain drive from gear box to spindle prevents slippage.



distributed and serviced in U.S.A. by NATIONAL ACME

Since their introduction in this country, BSA Single Spindle Automatic Screw Machines have enjoyed remarkable acceptance. Combining latest automatic screw machine principles with proven

design, they have produced at top standards of speed and accuracy with minimum unkeen.

BSA "Singles" are distributed and serviced in the United States by National Acme, in Cleveland, where adequate replacement parts are stocked -and you get the same active, experienced and interested service support as that on which National Acme's reputation has been built.

For specifications on all sizes, write for Bulletin BSA-54

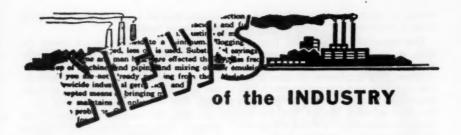
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### THE NATIONAL ACME COMPANY

177 East 131st St., Cleveland 8, Ohio

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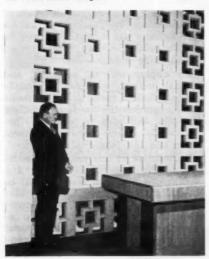


### All Faith Chapel Dedicated

Dedication ceremonies for Solar Aircraft Company's all faith chapel, attended by representatives of many religious faiths, culminate two and onehalf years work contributed by hundreds of Solar employees.

During the company's 25th anniversary celebration, Edmund T. Price, president and general manager, said he had long had the idea of the all faith

Edmund T. Price, Solar president and general manager is shown in the company's new all faith chapel.



chapel on the company's property. If as many as 50 employees favored the idea, and were willing to build the structure themselves on their own time, Price said, the company would donate the site, the plans and the materials.

The enthusiastic response of the employees was immediate. Soon a chapel council was organized to manage the project. Vice Admiral Wilder D. Baker, USN (ret.), Solar's director of public relations, became coordinator, and the chapel idea began taking shape.

Ground was broken on the day before Christmas, 1952. Donald Campbell, a La Jolla architect, offered to donate plans for the chapel, and a design based on mediterranean architecture was accepted by the chapel council. The building is  $35 \times 50$  feet, accommodates more than 100 persons and is on Solar's waterfront property in San Diego facing west toward the San Diego Bay.

Every Saturday a group of employees, including sometimes both top company executives and the newest factory trainees, gathered at the plant to work on the structure. A careful catalog of the skills of the volunteers was compiled so that an adequate number of carpenters, cement workers, bricklayers and others with necessary construction abilities was always present. Those without manual skills helped in other

ways, by serving lunch or acting as general handymen.

The cornerstone was laid Dec. 23, 1953, in ceremonies at the company's annual Christmas party for orphan children. The employees envision gradual additions and improvements to the chapel for years to come, for they feel that this spiritual project, like the cathedrals of Europe, is a living and growing testimonial to religious faith.

### Butterfield Division celebrates 75th Anniversary

Butterfield Division of the Union Twist Drill Co., Rock Island, Quebec, and Derby Line, Vt., is celebrating its 75th year of operation.

Founded in 1880 and incorporated in 1913, it has expanded from hand made wagon wheel axle cutters to the precision made taps, dies, reamers, counterbores, drills and cutters of today. It now employs 750 men from both nations. The buildings are divided by the international border. Each side operates independently of the other; however they both come under the management of Stanley L. Holland, son of the president, George F. Holland, of the Union Twist Drill Company.

## George W. Moore, Inc., celebrates seventy-fifth anniversary

Seventy-five years of activity in the screw machine products and set screw industries was celebrated last month by George W. Moore, Inc. of Waltham, Mass. Special anniversary events included a dinner at the Hotel Somerset, Boston, on Saturday evening, June 4, which was attended by company officials and employees, industry and trade association notables and local civic leaders.

The company was founded in Boston in 1880 by George W. Moore, and a Mr. Daley. The original plant occupied 5,000

square feet of space of the fifth floor of a Boston building.

George W. Moore passed away on March 7, 1925, at the age of 84. His three grandsons, George A. Moore, Jr., present president of the company, Harrington and Lawrence joined the firm in 1922, 1927 and 1928 respectively.

In 1944, the company purchased its present ultra-modern manufacturing facilities on the Boston and Maine Railroad in Waltham, Mass. The fourth generation of Moores, Richard Moore, son of George Moore, Jr., is now active in the company.

## Italy to Exhibit Machine Tools at Coliseum

Under the sponsorship of the Italian government, the Italian machine tool industry will exhibit its lines of metal-working tools at the Coliseum Machinery Show in Chicago, September 6-17. This exhibit will be coordinated through the agency of the Maserati Corp. of America.

"Booth 636, measuring over 1200 sq. ft., has been reserved, and members of the American and Canadian machine tool industry are cordially invited to visit the exhibit," said Dr. Guido Pruner, Italian trade commissioner.

On display will be horizontal and vertical milling machines, hydraulic surface grinders, radial drills, hydraulic tracing attachments for lathes, milling machines and shapers, engine lathes and vertical boring machines, toolroom lathes and iron workers.

Represented in this exhibit, in addition to the Maserati Machinery and Automobile Works of Modena, will be the Italian firms: Caser, Induma, Morando, Ficep, Tovaglieri and Duplomatic. Dr. Pruner will have his own information service at the show to assist visitors to establish new business connections in Italy.



### AUTOMATIC FEEDING AND SETTING

T-J Clinchors set clinch nuts with fully automatic 8" to 36".

Write for Clinchor bulletin 847; Rivitor bulletins 646
Underfeed and Gravity feed models, throat depths 8" to 36".

and 847. The Tomkins-Johnson Co., Jackson, Mich.

More and more . . . T-J Rivitors and Clinchors meet today's demands for faster assembly on a wide range of jobs . . . in aircraft, automotive, farm machinery, stampings old steel rivets up to '\( \frac{1}{2} \) (long. Air-powered sets aluminum alloy rivets or steel rivets up to '\( \frac{1}{2} \) (long. Throat depths

TOMKINS-JOHNSON

38 YEARS EXPERIENCE

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### Vacuum Melting Furnace Installed at Carboloy

The 1000-pound, semi-continuous vacuum melting furnace which recently went into operation at Carboloy Department of General Electric Co., Detroit, is expected to hasten developments currently bottlenecked on design engineers' drawing boards because of unavailable or costly materials, such as the gasturbine powered auto, which to date exists only in the form of experimental models due to the high cost of strategic materials used to produce critical parts.

The furnace is capable of purifying existing metals and alloys to such an extent that they can provide higher metallurgical performance. Depending on the metal, vacuum-melted alloys cost about 10 per cent more to approximately

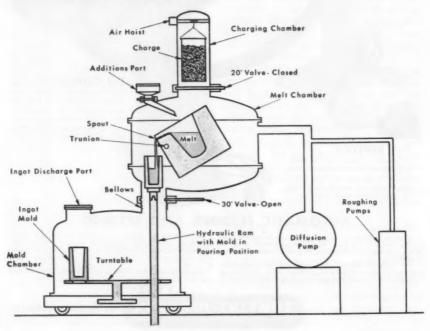
four times those melted conventionally.

Greatest uses currently for these metals, Carboloy spokesmen say, are in the gas turbine field—for aircraft, locomotive, stationary power, etc. and in the airframe industry for such items as landing gears and aircraft struts.

The new unit at Carboloy, which can handle specialized heats of 100 to 1000 pounds, is capable of producing two 1000-pound heats per shift. It will add roughly over 120,000 pounds of vacuum-melted alloys per month to the nation's capacity.

The metals are melted at temperatures up to 3200°F, in a furnace that is almost entirely evacuated of air. It is this method of excluding air, and the

Schematic showing new 1000-pound vacuum furnace installation at Carboloy Department of General Electric Company, Detroit.





For individual use or on a continuous line, Challenge Work Benches help get the job done — faster, easier, more profitably! Works with the machinist . . . bringing him better natural (left hand) lighting, wear-resistant top and handy storage facilities. Delivers real service dependability year after year.

A SIZE AND STYLE FOR EVERY
WORKSHOP . . . EVERY PURPOSE

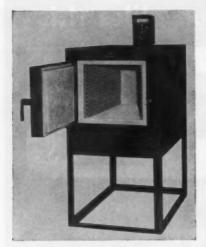
In 4 and 6 leg models. 3 styles, with or without shelf or drawer. 4 sizes from 28x48x2 to 28x84x2. Write for details to

THE CHALLENGE MACHINERY CO.



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MORE THAN TWO THOUSAND SATISFIED USERS
WILL TESTIFY YOU

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Less operator attention needed—Lucifer controls are EXACT. They reach SPECIFIED heat rapidly and retain SPECIFIED temperature without variation. No special experience required when you use a Lucifer Furnace.

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Finest refractory materials are built into Lucifer Furnaces for better, more efficient heat retention. Elements are guaranteed, long lived, trouble free.

WRITE FOR FREE LITERATURE, SPECIFICATIONS AND price list of Lucifer Furnaces in wide range of sizes—top loading and side loading types. Engineering advice without obligation. Write, wire or phone today.

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Over-all view of new Carboloy vacuum melting installation.

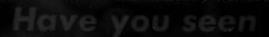
impurities air carries, which results in the production of superior alloys.

Metals such as titanium and zirconium, which are used as alloys in high temperature applications, can be easily added in sizeable percentages. According to Carboloy officials, the furnace is a forerunner of still larger units to come.

## Norton Co. adopts driver training program

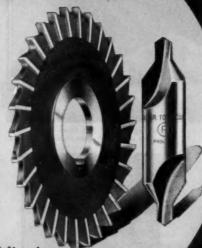
Faced with excessive maintenance costs on electric trucks and other mobile materials handling equipment, Norton Company, Worcester, Mass., manufacturers of abrasive products, adopted a program of driver training and licensing.

Many of the repairs were of the unnecessary type, brought on by misuse of equipment. Lift trucks had rolled off motor trucks because of failure to block the wheels, and loaded trucks moving onto elevators had exceeded the capacity of the elevators. Fortunately,



# Our NEW

In our definitive new catalog you'll find Circle R products pictured and fully described, with size and price listings, ordering instructions, and helpful data on speeds and feeds for most effective metal cutting. As specialists, we make nothing but circular metal cutting tools—the finest you can buy, though they cost no more. We are consultants on metal-cutting problems throughout industry, with particular reference to the new problems of automation. Ask for your free reference copy of Catalog N. Write direct or contact our Circle R Specialists in your district.



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## CIRCULAR TOOL CO., INC

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Specialists in ilar Cuttina Tools Since 1923 METAL SLITTING SAWS COPPER SUITING SAWS SCREW SLOTTING SAWS COMMUTATOR SLOTTING SAWS FUNCES SAWS + CIRCULAR KNIVES & ROTARY SHEAR BLADES + CIRCOLOY STEEL SAWS + SOLID & TIPPED TUNGSTEN CARBIDE SAWS COMBINED DRILLS & COUNT.



Setting speeds and feeds made as easy as tuning a radio . . . so simple any one can pre-set it.



Operator is free to concentrate on starting and stopping spindle, changing cutting tools . . . speeds and feeds have all been pre-set.

# now you can plan and . with the new

# Carlton

The Carlton Machine Tool Co. announces the introduction of the new Carlton-Leber speed-feed pre-selector and program systems. The two new devices offer faster, and therefore more economical hole drilling production.

Programming Here's how the Carlton-Leber programming works: your production engineering department studies the workpiece drawing and determines the sequence of drilling operations and the correct speed and feed for each. This data is recorded on a routing sheet or blueprint

### Carlton Radial Drills now come with your choice of 3 different



Manual gear shift: 2 shifter levers for controlling speeds, 2 shifter levers for controlling feeds.



Pre-select gear shift: 1 speed graduated dial and 1 feed graduated dial pre-set speeds and feeds.

pre-set speeds and feeds for an entire drilling program

# programming

and is transferred to the programming console.

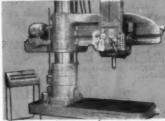
The programming console contains an indexing dial which shows the operation sequence number being performed. Operator has local control and can perform operations out of sequence by manually advancing or reversing the indexing dial.

Pre-selector For less lengthy or complicated drilling jobs, the programming unit can be disconnected through a selector switch and the pre-selector then becomes operative. The pre-selector saves time by allowing operator to select the

speed and feed for the next operation while the machine is under cut. Pre-selector may be furnished with or without the programming unit. In fact, you can now buy your Carlton radial drill with your choice of one of three different types of speed-feed control as illustrated below.

Be sure to see the new Carlton-Leber pre-selector and programming devices in action at the Machine Tool Show in Carlton booth 919. In the meantime, write for your descriptive bulletin. The Carlton Machine Tool Co., Cincinnati 25, Ohio, U.S.A.

speed-feed controls . . .



Pre-selector and programming gear shift sets up correct speeds and feeds for a complete sequence of operations.

Carlton

horizontal and radial drills



You're invited . . . to see the new Carlton-Leber pre-selector and programming devices. Visit us in booth 919 at the Show. the personal injury problem was negligible. Many drivers had learned to drive without adequate instruction, and consequently, had bad driving habits which needed correction. The study also showed that many of the major repairs were brought on by inexperienced drivers using the equipment when they had no business doing so.

The solution to the problem had two phases: first, a thorough training program for all drivers, and second, a plan to insure that only properly trained drivers would be allowed to drive the equipment.

Each department using mobile equipment submitted to the factory training department a list of those operators to be trained. At the completion of the course, these men were given license buttons to wear.

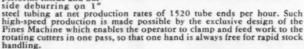
Featured in the lecture session was

# Deburrs 1520

1" TUBE ENDS PER HR. on PINES

END FINISHING MACHINE

Here's another outstanding example of how the Pines No. 600 End-Fin-ishing Machine is setting records for production speed and efficiency. To-day, at Configured Tube Products Company, Bellwood, Illinois, the Pines Machine (shownatright) performs inside and out-



#### **Exclusive Features Speed Work**

Still other outstanding Pines features such as quick, interchangeable tool holders, chuck inserts, 8-speed sheave (760 to 3920 rpm), sturdy spindle, and greas-sealed precision bearings assure fast, accurate work. The Pines No. 600 handles chamfering, pointing, facing, and reaming operations, as well as deburring, on stock diameters up to 2". Maximum feed stroke is 1-1/4". Automatic air-operated units for higher production work, and larger sizes up to 5" capacity are also available.



PRODUCTION SENDING . DESURBING . CHAMPIRING MACHINERY



how these machines cut production costs

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BLANCHARD SURFACE GRINDERS give you peak production and economy when maintenance is performed on schedule, and when you use the best wheel for each job.

For more than 25 years, Blanchard has been making wheels that do their jobs in less time, with less trouble and cost... whether the work is tough as copper or fragile as glass... whether it requires heavy roughing cuts or clean-up cuts with flatness of .000005" to .000010" and finish of 1 to 3 micro-inches.

Our quarter century of experience has proven that Blanchard grinders perform best with Blanchard wheels...on every job!

SEND FOR OUR NEW, FREE FOLDER on Blanchard cylinder, sectored and segment wheels in silicate, resinoid

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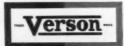
a training film produced by the Clark Equipment Company of Battle Creek, Michigan, entitled, "Safety Saves." Other manufacturers of equipment were very generous in providing booklets, samples of training programs, etc. Emphasis was placed on the proper operation of the trucks to insure not only personal safety but also longer truck life with fewer repairs.

The final step in the training program was an actual driving test through an obstacle course. Probably the most spectacular part of the program, the course was laid out in an outdoor paved area. Wooden pallets were used to outline the simulated aisles and passageways. Each operator was required to drive the type of vehicle with which he was familiar. In one test, he drove a straight course for a distance of 50 feet between pallets placed 4 feet apart. Then he drove through a serpentine course, both forward and backward.



The Verson Sheet Floater quickly and economically separates steel sheets and blanks for feeding presses, brakes, shears, etc. It magnetically separates the sheets—causes them to fan out for easy grasping. Feeding is speeded up and the possibility of die damage due to feeding more than one piece is minimized. The Sheet Floater can be used for rectangular, round and most odd shaped pieces. It is especially helpful on oily or burred steel that tends to nest when stacked. 3 models in 10 sizes each plus a Special Heavy Duty Adjustable Model. Send for bulletin.

A Verson Press for every job from 60 tons up.



# VERSON ALLSTEEL PRESS CO.

9303 S. Kenwood Ave., Chicago 19, III. So. Lamar at Ledbetter Dr., Dallas, Tex.

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The next test was to drive a loaded truck through a simulated aisle, placing the load in a space at right angles to the aisle.

Inspectors checked each operator on several points as he drove through the course. Driver testing was aimed at pointing out driver errors and bad driving habits rather than "flunking" anyone. A local representative of a materials handling equipment company

was hired to conduct the tests to keep the inspection impartial and objective.

Some driver opposition to the test was anticipated but none developed. Even the old timers found that the course was a stiff test of their ability and some found that they had developed certain undesirable driving habits over the years.

To forestall any adverse reaction by the men, the testing program was

# BALDOR GRINDERS

### **BALL BEARING - TOTALLY ENCLOSED - HEAVY DUTY**



Baldor Grinders are available in bench and pedestal types with 6" to 12" wheels. Baldor Grinders are better be-

More Rugged — Arbor diameter %" and "sealed-for-life" ball bearing Size .05.

More Versatile — Wide clearance between wheels and motor frame permits grinding of large or odd shaped pieces.

Baldor is a basic manufacturer of grinders—even the motors are built by Baldor.

Baldor 10" Series Grinder 34 h.p., 1 phase, 60 cy., 1725 rpm, 10" wheel. \$134.00



Special Carbide Tool Grinder built especially for sharpening carbide tools quickly and accurately. Reversible ½ h.p., motor withstands repeated overloads. \$149.00.

BALDOR ELECTRIC COMPANY 4368 DUNCAN AVE. ST. LOUIS 10, MO.

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played up in newspaper and television news spots. This seemed to give the drivers who took the test a little added prestige among their fellow workers.

At the conclusion of the testing period, a demonstration was held for representatives of other plants in the Worcester area.

All authorized drivers now wear license buttons on which their photographs appear. The supervisors in departments using trucks have also been trained and have their license buttons. The supervisor may designate new men as trainees if additional drivers are needed. Special buttons bearing the word "trainee" are issued to them. No other people are allowed to operate the rider type materials handling equipment.

A limited number of packets containing the written procedures, drawings of the obstacle course, written tests for drivers, etc., are available to companies interested in adopting a similar program. Inquiries should be directed to Norton Co., Dept. BB, Worcester 6, Mass.

### **CONTRACT JIG BORING**

# Now Available at B. Jahm

TOUGH PROJECTS OR PRECISION PRODUCTION DELIVERED TO SPECIFICATIONS...SCHEDULES!



### PERHAPS . . . YOU NEED THIS→

Master fixture for jet aircraft with bushings fitted to multiple holes to .0005".

### OR THIS

Huge radar housing fixture with over 200 individual holes—each held to ten-thousandths accuracy.



Whatever your jig boring requirements, Remember — B. Jahn's Master Toolmakers, working on 16 up-to-theminute jig borers, specialize in solving

individual tooling or production run problems. Discover the time, trouble and money B. Jahn jig boring skill can save you.

SEND FOR FACILITY LIST AND LITERATURE. REQUESTS FOR QUOTATIONS WILL BE HANDLED PROMPTLY.

B. Jahn

THE B. JAHN MANUFACTURING COMPANY, NEW BRITAIN, CONNECTICUT

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## Literature

# CATALOGS AND BULLETINS AVAILABLE FROM MANUFACTURERS

For copies of the literature in which you have an interest use the postage-paid postcard between pages 234-235. Merely circle the identifying number and mail the postcard.

- 1. Microfinish Comparator. To announce the new S22 Microfinish comparator surface roughness scale made by Electroforming, the Baptist Machine Co., Dept. BB, Ludlow St., Stamford, Conn., has issued a colorful four-page leaflet. Comparator permits roughness to be specified on the same basis as linear measurements.
- 2. Adjustable Limit Gaging. The Ames Snappergage measures both outside and inside dimensions, groove spacing, recesses or hard-to-get-at places and is adjustable, eliminating need for special gages. Bulletin and price list from Ames Instrument Co., Dept. BB, Concord, Mass.
- 3. Carbide Cutters, Rotary Files. A catalog bulletin from Beaver Cut Rotary File Co., Dept. MTB, 400 E. Slauson Ave., Los Angeles 11, Calif., lists and pictures their complete new line of rotary files, chatterless countersinks and high speed cutting tools. Cutters are 2½" o.a. with ½" dia. shank. Resharpening service is also outlined.

- 4. Automatic Index Tables. For drilling, tapping and other sequence operations, the Cleveland Tapping Machine Co., Dept. MB, Canton 6, Ohio, has introduced automatic index tables, sizes 21" and 34", with 6, 8, or 12 stations. Just released is a leaflet describing and illustrating these tables. Operation, construction, indexing cycle, indexing drum operation, and load capacity are fully covered.
- 5. Air Tools. Abrasive tools, including straight grinders, die grinders, small wheel grinders, grinders and sanders, and grinding wheels are among the many items illustrated and described in Catalog No. 564 issued by Chicago Pneumatic Tool Co., Dept. B, 6 East 44th St., New York 17. Catalog, containing 140 pages, includes impact wrenches, screwdrivers and nut runners, drills, hammers and gives operating recommendations.
- 6. Electric Furnaces. The Cress electric furnace for small parts heat treating and laboratory work is equipped with indicating pyrometer and cycling power

controller. Temperature range from 300 F to 2000 F. Send for leaflet from J. J. Cress Co., Dept. BB, 323 W. Maple Ave., Monrovia, Calif.

- 7. Stub Tap Standards just developed by the National Screw Machine Products Association, plus details on its own stub taps, manufactured according to these standards, are features of a new 4-page folder issued by Besly-Welles Corp., 100-B Dearborn Ave., Beloit, Wis. New shorter-length tap fits screw machines without alteration.
- 8. Surface Plates, Angles, box parallels and straight edges manufactured by the J. C. Busch Co., Dept. MTB, 165 S. Balclay St., Milwaukee 4, Wis., are listed in Catalog No. 123. Book also contains data of value to users of this type of equipment.
- 9. Die Springs. A catalog that shows the company's complete line of medium pressure, medium-high pressure and high pressure die springs has been published by Danly Machine Specialties, Inc., Dept. BB, 2100 S. Laramie Ave., Chicago 50, Ill. The 16-page book includes a simplified method of spring selection.
- 10. Vises, Platen, Swivel Bases. Donovan Mfg. Co., Dept. BB, 80 Batterymarch St., Boston, Mass., has issued a folder portraying its multi-swivel vises, platens, swivel platens, swivel bases, flanged vises, and swivel vises. All parts of the Master multi-swivel vise are interchangeable, enabling its use as a plain flanged vise, a plain swivel vise and a multi-swivel vise.
- 11. Gage Blocks. An 8-page illustrated catalog contains complete specifications and prices on the entire line of Ellstrom chromium plated gage blocks. Standards are offered in 28-block sets ranging from 8 to 92 pieces, with or without basic gage block accessories. Ell-

- strom Standards Div., Dearborn Gage Co., Dept. MB, 22038 Beech St., Dearborn, Mich.
- 12. Honing Machines for fast precision finishing of internal cylinders are described and illustrated in 16-page booklet from C. Allen Fulmer Co., Dept. B, 1211 First National Bank Building, Cincinnati 2, Ohio. Wide range of spindle and reciprocation rates.
- 13. Maintenance Instructions for LK air-operated clutch and interconnected flex-disc brake are given in Bulletin 5008, Ferracute Machine Co., Dept. B, Bridgeton, N.J. Brake provides a quick and accurate control for punch presses, power shears and similar machines requiring start-stop operation.
- 14. Indexing Fixtures. G & H collet type indexing fixtures are highly versatile, provide fast finishing of multimachined precision parts, speed production. Folder distributed by Gustafson Engineering Co., Dept. BB, 327 Elm St., Fitchburg, Mass.
- 15. Toolroom Clamp. Self-contained clamp manufactured by the Hi-Lo Tool Products Co., Inc., Dept. B, 18525 Weaver Ave., Detroit 28, Mich., is subject of 4-page booklet which is yours for the asking. Both Tee bolt and clamp rest are serrated in a unique manner, making rapid adjustment possible.
- 16. Adjustable Limit Snap Gage. The H v H gage is fixed to a go and no-go precision tolerance. It is set with gage blocks and then the parts can be easily checked. Four-page folder explains this method of checking. H v H Tool & Instrument Co., Dept. B, 150 Lafayette St., New York 13.
- 17. Hydraulic Drill Units, automatic cam feed drilling units, lead screw tapping units, multiple spindle heads, automatic index tables and machine bases

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READERS' SERVICE DIVISION

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### **MACHINE** and TOOL BLUE BOOK

READERS' SERVICE DIVISION

WHEATON, ILLINOIS

### MACHINE and TOOL BLUE BOOK AUGUST, 1955 Please send the following literature which I have encircled below: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 18 19 20 21 22 23 24 25 26 27 28 29 30 31 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 NAME...... POSITION..... COMPANY STREET ..... CITY ZONE STATE Tear Off and Mail These Postage-Paid Postal Cards MACHINE and TOOL BLUE BOOK AUGUST, 1955 Please send the following literature which I have encircled below: 5 6 7 8 9 10 11 12 13 14 15 13 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 NAME......POSITION.... COMPANY ..... STREET .....

# ENGRAVE

PLUG AND RING GAGES



Many leading manufacturers have found the NEW HERMES the most versatile portable engraver for rapid marking of tools - nameplates panels - dials.

- Adjustable for 15 ratios.
   Self-centering holding vise.
- Automatic depth regulator.
   Adjustable copy holders.

Send for Catalog No. IM-28

NEW HERMES ENGRAVING MACHINE CORP.

13-19 University Pl., New York 3, N. Y.

are described in 20-page brochure from the Hartford Special Machinery Co., 269 Homestead Ave., Hartford 12, Conn.

- 18. Casting Process. Bulletin stressing the use of the Ellis casting process for the production of microwave fittings is available from Howard Foundry Co., Dept. MB, 1700 N. Kostner Ave., Chicago 39, Ill. Many types of complex investment cast parts can be produced by the process.
- 19. Thread Repair. The current issue of Heli-Call, house organ of the Heli-Coil Corp., Dept. B, Danbury, Conn., describes shop-packs, packages containing a supply of wire screw thread inserts, a tap of proper size and an inserting toof, plus complete instructions. Case-history accounts are well-illustrated.
- 20. Air Tools. The new Ingersoll-Rand catalog (Form 5200-A) is devoted entirely to the problem of running nuts, bolts, cap screws, and other type fasteners. A two-page spread is devoted to each size Impactool. On-the-job application pictures and case history studies are also included.
- 21. Carbide Tooling, Blanks, Inserts. The latest catalog, No. 55, from Kennametal, Inc., Dept. BB, Latrobe, Pa., describes the company's complete product line of carbide tooling, blanks and inserts. Also detailed is their latest general purpose steel-cutting grade K21, and K11, a grade which provides high resistance to abrasion.
- 22. Notcher. The J. F. Kidder Mfg. Co., Inc., is distributing an illustrated leaflet depicting the Little Blacksmith No. 43X notcher. Capacity is 7½" x 7½", 90° notch in 14 gauge mild steel, or 16 gauge stainless steel. Weight of notcher is 270 lb., bench space 21" x 16".
- 23. Vibration Control. A complete catalog giving specifications and perform-

- ance data for their vibration, shock and noise control products is available from the Korfund Co., Inc., 48-39 W. 32nd Pl., Long Island City 1, New York. Bulletin presents 11 types of vibration isolating units which utilize steel springs, rubber, and ccrk—either singly or in combination. Installation photos included.
- 24. "Simplified Steel Terms and Engineering Data" is a 32-page dictionary of steel terms of particular value to men who buy or use cold finished steel bars. Photographs, curves and tables cover subjects such as standard grain sizes for steels, Shepherd grain size fracture standards, approximate hardness conversion number for steel, based on Brinell. LaSalle Steel Co., Dept. BB, Chicago 80.
- 25. Apprentices. Why do some apprentices quit before completing their apprenticeship? What happens to them after they drop out? Answers to these and other questions are contained in a booklet titled "Follow-Up Study of Former Apprentices," just issued by the U. S. Department of Labor, Publications Branch, Bureau of Apprenticeship, Washington 25, D. C.
- 26. Rivet Selector. At the flick of your finger, this 4" x 8" slide rule selector gives specific dimensions, clinch allowances and clearances for standard rivets. Selector is divided into four parts for bifurcated, cutlery, drilled and extruded rivets, and contains information not previously available. Milford Rivet Co., Dept. BB, Milford, Conn.
- 27. Dies and Tools. A beautifully designed 20-page booklet from Lamina Dies and Tools, Inc., Dept. B, P. O. Box 31, Royal Oak, Mich., takes the reader behind the scenes at Lamina to show how the company's dies and tools are manufactured and tested. Lamination dies, gear dies, progressive dies, special



Rivett offers two lathes for one! savings in toolroom and production.

This is particularly true if you look at the Rivett Model 1020S Precision Toolroom Lathe. It features sensitivity for turning tolerances within .0004"; and heavy biting ruggedness for a 1/4" cut at .020" feed in cold rolled steel. Here is an instrument and engine lathe combined to handle any work within its 121/2" swing and 20" centers.

See Model 1020S in action at Booth 805 - Machine Tool Show.

26 Features Distinguish Rivett 1020S

Write for free catalog

Catalog 1020B shows you what a Rivett can do in your shop.



ATHE AND GRINDER, INC.

MTR 8 BRIGHTON 35, BOSTON, MASS.

Encircle No. 323 on Card, Opposite Page 65

purpose equipment, fixtures, millinggrinding-slotting machine, guide pins, and guide pin bushings are treated throughout the remainder of the book.

28. Reciprocating Boosters. Miller double-acting reciprocating boosters are illustrated and described in a 4-page pamphlet offered by Miller Fluid Power Co., Dept. B, 2040 N. Hawthorne Ave., Melrose Park, Ill. The leaflet also illustrates a basic circuit, two rapid pres-

sure build-up circuits, two slow pressure build-up circuits, and mounting and dimensional data covering these boosters in 4", 5", 6", 8", 10", 12", and 14" bores in 1" through 5½" dia. rams.

29. Internal Rotary Gear Shaving Machine. Bulletin S55-4 describes Red Ring Model GCR-12" internal rotary gear shaving machine, product of National Broach & Machine Co., Dept. MTB, 5600 St. Jean Ave., Detroit 13,



No ordinary bench drilling machine, but an extremely accurate, high speed, sensitive machine for precision drilling. Drills from "4" down to extremely small sizes. Successfully used down as far as .008".

Table and column exactly squared, one to the other, and built with strength and rigidity for maintained accuracy. Hardened and ground spindles insure long life. Sealed ball bearings throughout for smooth operation from 4,000 r.p.m. to 10,000 r.p.m. Motor, driving belt, and spindles entirely enclosed for safety. Available with 1, 2, 3 and 4 spindles.



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Sole Sales Agent

PRATT & WHITNEY

Division Niles-Bement-Pond Co .-- West Hartford, Connecticut

15G54

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MACHINE and TOOL BLUE BOOK



This special mechine with automatic indexing fixture core-drills piston pin holes and drills angular oil holes. It uses six Ex-Cell-O Power Units (shown without belt guards) operated from a central push-button station.

Ex-Cell-O Hydraulic Power Units feed and rotate cutting tools in easily controlled automatic cycles. They actuate single tools or multiple spindle heads for such operations as drilling, reaming, counterboring and spot-facing. Hydraulic operation provides smooth, powerful movements.

A machine utilizing Ex-Cell-O Power Units can be very simple, with manual loading and clamping. Or it can be designed with work handling equipment for automation...

For complete information, including specifications and installation drawings, ask your Ex-Cell-O Representative or write Ex-Cell-O in Detroit.

EX-CELL-O CORPORATION DETROIT 32. MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS - GRINDING SPINDLES - CUTTING TOOLS - RAILROAD PINS AND BUSHINGS - DRILL JIG BUSHINGS - AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS - DAIRY EQUIPMENT

85-14

Mich. Production advantages, design features and machine operation are described in detail with close-up photographs and line drawings.

30. Dial Indicators. Petz-Emery Inc., Dept. MB, Pleasant Valley, N.Y., has released a 4-page bulletin, No. 455, on its Em-re dial indicators. The complete line of 24 models is built around only 31 parts. All but six parts are common to all models. Indicators with a range

of .250" or .125" can be converted to any one of 6 other models in these two ranges by replacing only a rack gear and the dial.

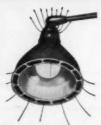
31. Hitch Feed. A bulletin picturing and describing the automatic Surefeed is available from the Producto Machine Co., Dept. BB, 990 Housatonic Ave., Bridgeport 1, Conn. This hitch feed, which comes in 2" and 3" models, can be mounted on the die set so that the

# New Adjustable-Arm \*\*Rive\*\*\* Collect Dazors

Light Machines and Benches at Low Cost



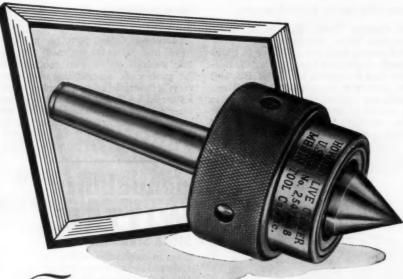
Get cool, efficient lighting with this new Dazor-quality fixture. Holds fast in any desired position, despite vibration or shock. Universal base. Top-mounted reflector shown above. Either 31" arm extension (No. 1100) or 20" (No. 1101). Gray baked enamel over bonderizing. Call your Dazor distributor. Dazor Manufacturing Corp., St. Louis 10, Missouri.



... Makers of

# DAZOR FLOATING LAMPS

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MACHINE and TOOL BLUE BOOK



# inest LIVE CENTER MADE

### HERE'S WHY

- \* BACK UP RING assures positive rigidity.
- ★ Bar Expansion Eliminated by means of Thrust Spring.
- \* Special alloy tool steel spindles, hardened and ground.
- \* Matched precision ball bearings, mounted in tandem.
- \* Oil impregnated bronze tail bearing.
- \* Points pre-loaded and ground after assembly.
- \* A distinctive oil seal in front of bearings protects them from all foreign matter. Chips, dirt and cutting oil cannot reach the bearings.

The HOWARD Live Center is the ONLY center that offers the patented BACK UP RING. The Ring maintains solid contact between the quill and head of the center . . . thus greatly increases over-all rigidity.

Send for the new MELIN TOOL Catalog No. 54-C . . . it lists, in addition to specifications and prices on the HOWARD Live Center, the complete MELIN TOOL End Mill Line.



**MELIN TOOL** COMPANY, INC. 3374 West 140th St. Cleveland 11, Ohio



two units can be handled as one.

32. Carbide Tools. End mills, drills, reamers, burrs, countersinks and special cutting tools are contained in beautifully illustrated Catalog No. 102, Rotary Tool Industries, Inc., Dept. BB, 4461 W. Jefferson, Detroit 9, Mich. All end mills are ground from solid carbide in a variety of styles and sizes from 1/16" dia. through ¾" dia. Keyseat cutter with solid carbide head has straight

flutes, adaptable to all types of slotting, gives fine finishes.

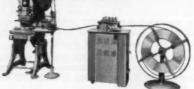
33. Internal Collet Set. A complete Royal internal collet set, each item fitting securely in its own compartment for protection, accessibility and accuracy, is described and pictured in a leaflet issued by Royal Products Manufacturers, Dept. BB, Mineola, N.Y. Reverse side illustrates the collets in detail.

# **Economy** · **Dependability**

### WITTEK STOCK STRAIGHTENERS

Used in conjunction with a reel stand and automatic feed for punch presses, the Wittek Stock Straightener is a selfcontained, motor-driven unit designed for maximum efficiency in the continuous straightening of coiled stock. Standard models handle stock with widths up to 12 inches. An infinitely variable speed drive permits any desired straightening speed so that the proper slack is maintained in the straightened strip between the unit and the press feed.





Write for full particulars
WITTEK Manufacturing Co.

4321 W. 24th Place . Chicago 23, Illinois



# **Brand New!**

haskines.
hask AIR Grinder...
most powerful
air turbine grinder
in its class!

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R.P.M. (1/5 H.P. prony brake test)

for Complete details



2645 W. Harrison St. Chicago 12, Illinois

- Permanently sealed bearings . . . never needs lubrication in air lines or grinder.
- Removable nose piece for deep grinding.
- Gyro action of turbine holds tool steady.

Here's power—SUSTAINED POWER—like you've never experienced before in an air grinder . . . power unexceeded by any other air grinder in the same price range . . . maintains its high-speed efficiency under load! Built with a lightweight, contoured, hand-fitting aluminum housing, the Haskins

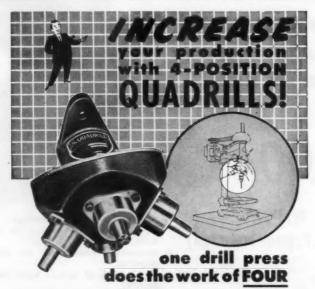
haskam Grinder handles easily, balances perfectly . . . excellent for the most precise grinding job. Complete kit includes: carrying case, adapter hose, mounted points, dressing stone and wrenches.

Encircle No. 329 on Card, Opposite Page 65

34. Lathe Centers. Literature describing the Red-E double row bearing assembly centers has been published by the Ready Tool Co., Dept. MTB, 554 Iranistan Ave., Bridgeport, Conn. Bearing assemblies are engineered to take the maximum radial and thrust loads in high speed production.

35. Precision Measuring Instruments. Catalog 22 and new price list are obtainable from Tubular Micrometer Co., Dept. B, St. James, Minn. Instruments included are: micrometers; snap gages; telescoping gages; vernier tools; rule depth gage; rule depth and angle gage; steel rules, thickness gages; dial indicator tools, etc.

36. Geared Head Lathe. The Sheldonbuilt Sebastian 15" geared head lathe is described in a 4-page circular. Complete specifications, including capacities, design features and accuracy tests are



Send NOW for additional information on how YOU can increase YOUR production without additional equipment!

Drill — ream — countersink and counterbore, all on one drill press without setting up for each operation. A simple rotation of this turret head brings any one of four drills or cutting tools into position. Accurate — fast — economical! Try Quadrill — it will earn you more profit thru less production cost.

CHICAGO QUADRILL

\_\_Company\_

846 BUSSE HIGHWAY, DESPLAINES, ILLINOIS

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MACHINE and TOOL BLUE BOOK

The Bigger Difference Brings BIGGER TIME SAVINGS!

YOUR BRIGHTBOY DISTRIBUTOR CAN NOW SUPPLY YOU WITH RUBBER-CUSHIONED STOCK ABRASIVES MATCHED TO JOB REQUIREMENTS!

THESE TWO WHEELS MAY LOOK ALIKE. But in your shop each could have a widely different application. They're both alike in that they're both Brightboy. Either one, or any of the other many Brightboy texture combinations frequently can give you up to 50% in time savings.



One of these Brightboy Wheels is compounded with SILICON CARBIDE, the other with ALUMINUM OXIDE.

In both grains you have wide selection of UNIFORM TEXTURES AND GRAIN SIZES RANGING FROM EXTRA FINE TO EXTRA COARSE, IN SOFT, FIRM AND TOUGH RUBBER BINDERS.

- \* YOU CAN NOW CHOOSE A RUBBER-CUSHIONED STOCK ABRASIVE PARTICULARLY MATCHED FOR A GIVEN JOB.
- \* YOU CAN LARGELY ELIMINATE THE ANNOYANCE, EXPENSE AND DELIVERY DELAY OF MADE-TO-ORDER "SPECIALS."
- \* YOU CAN COUNT ON DEPENDABLE UNIFORMITY, PROMPT DELIVERY.

Brightboy burrs, cleans, finishes, precision - polishes, in one fast operation. A Brightboy finish frequently serves as the final polish. Rubber and abrasive, working together give Brightboy scope and adaptability far beyond other methods—give you a new, wider, almost unbelievable concept of finishing. Alert produc-

tion men now explore Brightboy applications as regular routine prior to the setting up of new work jobs.

Ask your dealer NOW for details on multi-use Brightboy, and for the new Brightboy catalog. Advise us if he cannot supply you. Write us on any problem where finishing is involved.





BRIGHTBOY INDUSTRIAL DIVISION WELDON ROBERTS RUBBER CO.

95 North 13th Street Newark 7, N. 1

America's Pioneer Manufactures of Rubber-Bonded Abrasives included. Contains close-up views of important design features. Sheldon Machine Co., Inc., Dept. MTBB, 4258 N. Knox Ave., Chicago 41, Ill.

37. Materials Handling Equipment. A condensed catalogue, No. 554, containing 50 pages of technical data, description and photographs of vabratory equipment, feeders, conveyors, power tools, shaft seals, diesel pile hammers, gasoline hammers, selenium rectifiers

and other materials handling equipment has been published by Syntron Co., Dept. B, 300 Lexington Ave., Homer City, Pa.

38. Wire and Ribbon. A booklet describing the facilities of Sylvania Electric Products Inc., Dept. MB, 1100 Main St., Buffalo 9, N.Y., for the manufacture of fine wire and ribbon, wire and ribbon parts, and small parts plating has just been issued by the company.

# MARVECO LIVE CENTERS CUT PRICES

MODEL A SAOOO SAOO

MODEL AX \$4800 \$3600

MODEL B \$5200 \$4000

CALL YOUR LOCAL DISTRIBUTOR
OR WRITE

MARVEL TOOL & MACH. CO. 1090 N. RIVER ROAD ST. CLAIR, MICH.

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# A NEW CONCEPT!

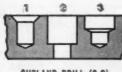
## MOHAWK

# Size-Optional

SUBQLAND

Believing that there is too great a void between standard and special tooling, Mohawk has designed and developed a semi-standard subland tool.

The Mohawk Size-Optional Subland is machined, hardened and placed in a stock bin. This results in a material saving to the customer in set-up costs, reduces delivery time to a fraction of that usually required for special tools, and allows a tremendous reduction in inventory. In ordering these Size-Optional Sublands, the customer is limited only in relation to shank specifications, and partially on overall length requirements. Diameters and step lengths are completely optional to fit the particular application. Write for full details.



SUBLAND DRILL (2-2)

- (1) Drill—Chamfer (2) Drill—Counterbore (3) Drill—Drill

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NORMAL DELIVERY 1 WEEK FROM RECEIPT OF ORDER

worlds largest producer of Sublands

The booklet also carries valuable chemical composition charts indicating percentages of base material used in the wire and ribbon.

39. Clamp Assembly. A new method claimed to reduce precision riveting costs is outlined in a 12-page bulletin issued by Siewek Tool Co., Dept. B, 2862 E. Grand Blvd., Detroit 2, Mich. On-the-job application photographs illustrate the booklet. Clotol (close

tolerance) clamp assembly is featured. Detach-a-clamp, a detachable unit that locks into pre-located inserts is also described.

40. Comparator Charts. A brochure describing chart service for optical comparators is being offered by Vanguard Instrument Corp., Dept. B, Valley Stream, N.Y. Several typical cases with cost figures are given. Also covered are



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Horizontal Swivei Type

#### MULTI-PURPOSE WONDER GRIP VISES

4 STEPPED JAWS PERMIT CLAMPING of rough castings, irregularly shaped, round, and tapered pieces accurately and quickly, eliminating need for special jigs or fixtures. Narrow stepped jaws allow free access to and measuring of work pieces and provide clearance for cutting tools. Small work pieces machined on three sides without reclamping. Easy and quick to mount and align on any machine. Holds rigid in any position without vibration. Various capacities and extra soft jaws available.



Horizontal & Vertical Swivel Type

Tested for Performance to High Amer. Standards
Immediate Delivery from N.Y. Stock

MADE IN GERMANY

**Low Competitive Prices** 

- Quick Change Chucks and Collets
- Wille-Grip Keyless Drill Chucks
- Milling Machine Arbors, Adapters, Arbor Spacers and Bearings
- Lathe Mandrels





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TAPPING

**ATTACHMENTS** 

Reversible safety tapping

attachments with adjust-

able graduated friction

drive, hardened, ground

and lapped, complete with torque bar and handles. Precision

Also United States Distributors
of European Machine Fools

made

throughout

# DISCOVERY of IRON ...

changes world picture...and advances the use of abrasives.

At the time Egypt was flourishing, a new civilization was evolving in an adjacent section of the globe. From around 2000 to 400 B.C. the power of the world shifted to Asia Minor with the empires of

Assyrians, and Persians. Here, civilization grew up and developed, and the wonder metal of the age, iron, came into general use.

ON THE MISTORY OF ABABABUES
ON THE MISTORY OF ABABABUES
ON CHICAGO WHEEL & MPG. CO.

ACENT HITTIES discovered iron about 1300 B.C. in what is now Armenia, and began distributing it throughout the Near East. Iron daggers abraded to a smooth finish were the first implements made of the new metal. Perhaps the first instance of iron being mentioned in connection with weapons was a gift of a dagger from the Hittite King Hattusil to his son-in-law, Ramesis II of Egypt.







were the Assyrian hordes. Their armies were the first to be equipped with weapons of iron. Arrow tips. spears, and scythes attached to chariots were made of cast or hammered iron crudely abraded by stone IN 1000 B.C. the scourge of the civilized world and silica.



including the grinding of the harder, high tempera-The polishing and finishing of iron implements is a simple matter today. Over 200 different types of grinding wheels and other abrasive products are available from Chicago Wheel for use on all metals lure alloys. If you have a finishing or grinding probem, let us help you solve it.



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& MFG. CO.

Dept. MT Manufacturers of abrasives, precision grinding wheels and mounted points for over 65 years.

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direct-view overlays for casting inspections.

41. Abrasive Wheel. All-Four, the all-purpose aluminum alloy abrasive wheel with four exclusive features: (1) rubber permanently bonded; (2) continuous working surface; (3) double-action safety lock; (4) precise and accurate balance, is the subject of flyer issued by C. R. Vogt & Co., Dept. BB, 1528 3rd Ave., Moline, Ill. Wheel grinds,

polishes, deburrs, and sands.

42. Punches and Dies. Whitney Metal Tool Co., Dept. B, 402 Forbes St., Rockford, Ill., has compiled a new 16-page punch and die catalog. Tools are standardized. Catalog is organized in sections by the maximum hole sizes for various standardized types of punches. This covers up to 1" round holes and 11/16" square holes.

43. Band Saws. Variable speed drive



# no fuss...no muss

#### WHEN YOU BEND WITH A PEDRICK

Pipe, tube and structural bending with Pedrick Production Benders is the smoothest, simplest, cleanest operation you can imagine. Even usually difficult bends are a cinch, and the costs-really low!

Write us your bending problem-we think we can supply a cost-cutting answer. Pedrick Tool & Machine Co., 3640 N. Lawrence St., Philadelphia

40, Pa. Dept. 3.



FREE "PEDRICK LINE" BULLETIN. WRITE TODAY.

production benders

saws, in five models, are described in booklet of W. F. Wells & Sons, Dept. MTB, North on 131, Three Rivers, Mich. The manufacturer claims that greater range of speed plus more power combined with a graduated pressure valve permits choice of proper blade speed and pressure for maximum production and blade life from high speed or high carbon steel blades.

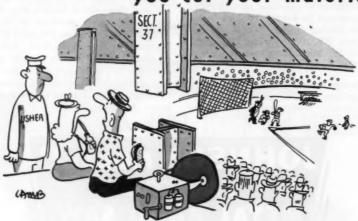
44. Hydraulic Cylinders. Honed cylinders

manufactured to customers' specifications are described and pictured in bulletin from American Hollow Boring Co., Dept. BB, Erie 4, Pa. The company produces cylinders from 1½" to 15" id in lengths to 27'. Cylinders may be furnished in seamless tubing, with welded flanges and bases; from solid bar stock, bored and machined to shape; or as forgings with flanges and pads forged integral, heat-treated to specified physical properties.



cut your costs . . . where

you cut your materials



"I paid good money to see this game, and I intend to see it!"

Is your view of cost-economy obstructed by old-fashioned material cutting methods? If so, let us show you how dramatically some people have changed the picture by the use of abrasive cutting with specialized Allison Wheels.

Allison abrasive cutting wheels contribute to faster, better, cheaper production by greatly speeding the cutting operation and reducing time

and labor costs.

For almost all materials, there is an Allison Wheel to fit the job. So don't delay. For a clear-cut view of bigger, better production, get the complete story from Allison, specialists in abrasive cutting for over 30 years.

WHEELS FOR PORT-ABLE GRINDERS
Allison supplies the finest grinding wheels for portable grinder

work.





MASONRY ABRASIVE CUTTING WHEELS Ask for further information about Allison's complete line of wet or dry masonry cutting wheels.

the best way to cut many materials . . .

the only way to cut some.



THE ALLISON CO., 264 ISLAND BROOK AVENUE, BRIDGEPORT 8, CONN.

Encircle No. 340 on Card, Opposite Page 65

45. Master Gages, jigs, fixtures, tools and indexing equipment built to meet the customer's exacting specifications are presented in 4-page booklet issued by the Master Spline Tool and Gage Co., Dept. BB, 19760 W. Eight Mile Rd., Detroit 19, Mich. Engineering service also offered.

46. Spring Cages. In high production dies, springs fail due to fatigue, excessive flexure. Spring cages retain the broken spring pieces in the pocket provided for the operative spring, thus keeping them out of harm's way. Motorol spring cages, product of Motorol Engineering Co., Dept. BB, 8414 W. Mc-Nichols Rd., Detroit 21, Mich., are made in special diameters to enable use of standard '%" increment drills for drilling spring pockets: seven diameters, 14 lengths, for a total of 66 standard items. Booklet available.



Whether in large shops or small . . . for production or occasional cutting on jobs where a smaller capacity range is sufficient, this handy, efficient Model B offers the traditional Johnson SPEED, VERSATILITY and ACCURACY at an investment that is surprisingly small. Available in Dry or Wet Cutting Models.



## JOHNSON MANUFACTURING CORP.

1012 BARNES STREET . ALBION, MICHIGAN

Encircle No. 341 on Card, Opposite Page 65

#### **Hollow Mill Maker finds**





Write for Copy of "CUTTING TOOL MATERIALS"

This 36-page illustrated booklet analyzes and compares types and covers grade selection for all major classes of cutting tools, etc., invaluable data for production men. Write for your copy today.

Address Dept. MB-68

The maker of these adjustable hollow mills required a steel that would give top performance in a variety of jobs—turning, tapering, facing, chamfering and trepanning. After thorough testing, Ludlum's high speed DBL-2 was selected.

DBL-2 is an improved general-purpose high speed steel. It contains tungsteen molybdenum and vanadium in such proportions that it excels 18-4-1 for most applications. DBL-2's unusual combination of high hardness with toughness, its ability to hold a fine grain over a wide hardening range, and the fact that it easily machines many diverse types of stock, made it particularly well suited for this job.

In addition to these advantages, DBL-2 can be heat treated in the same furnaces and atmospheres as 18-4-1 without fear of harmful decarburization. These DBL-2 blades were heated to 2250 F, oil quenched and drawn twice at 1025 F. After heat treatment, blades easily machined such stock as aluminum, stainless steel, carbon steel, aircraft steel, plastics, bronze, screw stock, cast iron and brass.

There is an A-L tool steel to meet your toughest requirements. Call your A-L representative or distributor today . . . or write Allegbeny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania.

For complete MODERN Tooling, call Allegheny Ludlum



Encircle No. 342 on Card, Opposite Page 65

#### SAVE VALUABLE SHOW TIME!

Write for your FREE Admission Form Now!

Fill in this blank. Cut it out and mail it to us now. We will send you a complimentary admission ticket to the Coliseum Machinery Show. By presenting a filled-out admission ticket at the entrance to the show, you will save all registration delays and entrance fees. (The Coliseum Machinery Show is on your way from the "Loop" to the Machine Tool Show.)

#### More Time to See "All Three"

- 1. Machine Tool Show (International Amphitheatre) 2. Coliseum MACHINERY SHOW
- (Chicago Coliseum)

3. Production Engineering Show (Navy Pier)

Chicago, Illinois (COLISEUM MACHINERY SHOW) Sept. 6th-17th (Free Admission Service) SHELDON MACHINE CO. INC. Gentlemen: Please send my free admission ticker to the Coliseum Machinery Show. Company Name

Street Address

Sholdon INTERESTED IN NEW State

Shouston 13" 11" IN NEW State

Morizontal Milliand 15" 13" CATALOGS DESCRIBING:

Sholdon 12" Shape Maching Geared Mead Lather

representative call Company

All of these will be demonstrated at the **COLISEUM SHOW** BOOTH 702 CHICAGO





Write for these new catalogs to preview our "tools in action" display at the Coliseum Machinery Show, Booth #702.

CHECK the wide range of Sheldon precision toolroom and production lathes, milling machines and shapers you want to be sure to see.

CHECK the important features of these modern machine tools that you will want demonstrated.

CHECK-IN at Sheldon Booth No. 702, Chicago Coliseum Machinery Show. Take your own test cuts. for yourself, the performance of these new and modern cost-saving machine tools.

Builders of Sheldon Lather, Milling Machines, Shapers and Sebastian Lather

SHELDON MACHINE CO., Inc. . 4242 North Knox Ave. Chicago 41, III.



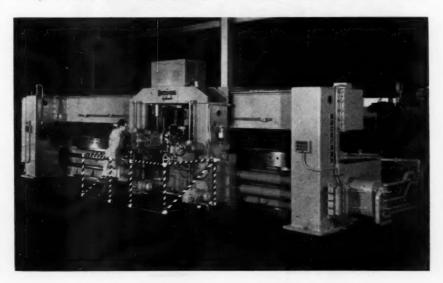
#### **new** in Metalworking

#### Hydraulic Plate Edge Planer

This new 14 foot stroke hydraulic plate edge planer has been developed by the Rockford Machine Tool Co., Dept. K, 2500 Kishwaukee St., Rockford, Ill.

A vertical column is attached to either end of the bed and a long work clamp overarm, containing eight hydraulic cylinders, operates its four work clamp shoes. The bed of the machine has two vertical ways on which are mounted the machine saddle.

The saddle reciprocates from 10 to 200 feet per minute and cutting speeds are claimed to be infinitely adjustable. It carries a right and left hand side



August, 1955

head rail on which are mounted the two side heads that carry the cutting tools. The side head rails are joined across the top by a heavy welded steel column top.

Mounted on the back of the saddle are two heavy duty double end hydraulic cylinders. The entire saddle assembly, plus the two cylinders, moves back and forth while the cylinder rods remain stationary with the bed and columns.

A dual control system incorporated in the machine enables the operator to control most saddle movements and all head movements from the stationary pendant or from a movable pendant on the platform of the saddle. Both side head rails of the saddle are equipped with handwheel operated work locators.

Use ACTION Card, opposite page 64. Encircle No. 1



OF DETROIT

DE VLIEG brings you a new addition to the Famous Microbore Line OF PRECISION TOOLING



A few desirable territories are being opened and qualified representatives are invited to visit our booth at the Machine Tool Show.



See the comprehensive range of Flash-Change equipment and Microbore Precision Tooling at the DeVlieg Exhibit, Machine Tool Show, at Chicago, September 6-17, Booth 1317.

DE VLIEG MICROBORE CO.

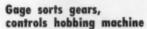
2720 WEST FOURTEEN MILE RD., ROYAL OAK, MICHIGAN

#### Tailored Machine Mount for Small, Accurate Work

Often it is desirable to perform a series of precision operations on a multiple spindle machine. A single work station can be created thus, and all of the related operations can be brought under one responsibility. Such is the unit illustrated here. which comprises one Varimatic super sensitive drilling machine. two "A-M" super sensitive drilling machines, and one super sensitive tapping machine.

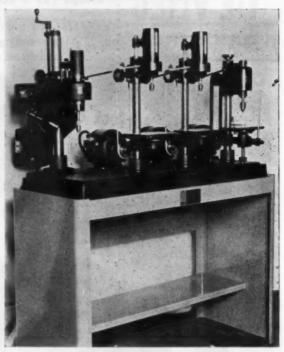
Each of the machines included in this unit is equipped for a specific duty in the production drilling, reaming, tapping operation. Hamilton Tool Co., 826 S. Ninth St., Hamilton, O.

Use ACTION Card, opposite page 64. Encircle No. 2.



AIL's Type 80 automatic gear gage and hobbing machine control sorts gears according to production tolerance limits and is claimed to permit control of the hobbing machine so as to prevent production of scrap and reduce the cost of making gears.

Each gage is custom-designed. Sorting gears according to tolerances established by the user, the Type 80 is capable of handling as many as 1000 gears per hour. Automatic indicators signal when the pitch diameter falls outside allowable limits, also indicating when the hob has begun to dull. An automatic circuit removes power from the hobbing machine if it produces too many gears





# MEW

SEIBERT DRIVERS

# PERMIT FASTER AND EASIER TOOL CHANGES IN CLOSE-CENTERS

★ Seibert now offers a new, improved adjustable Tap Driver, available in both Tension or Compression types, that is easier to work with in close-center jobs and provides added strength and rigidity to the hose of the float. With the new Seibert one-piece holder, taps are now held securely and accurately in place by a trepan clamp. This design feature permits foster and easier change of taps and eliminates the hex nut method of holding which is difficult to work with in close-center work and which, on occasion, will twist off the nose of the float if turned too tight. Elimination of the hex nut also permits greater clearance for tapping in counterbored holes.

#### PRECISION-BUILT TO MAINTAIN CLOSE TOLERANCES

Like all Seibert Production Holding Tools, these new Tap Drivers are precision-built from highest quality alloy steel, hardened and ground for perfect fit. Diameters are held to .0003", and total concentricity 6" from the nose is held to within .002" (total indicator reading).

#### ADDITIONAL DATA

Write today for Folio 2-50 illustrating and describing the complete line of Seibert Adapters and Tap Drivers.



View of new trepan method of holding that is easier to work with and provides greater clearance in closecenter jobs.



Shur-Lock Adapter Bodies



Shur-Lock Micro-Nuts



Spindle Extension Assemblies— 800 Series



Spindle Extension Assemblies— 900 Series



SEIBERT & SON, INC. CHENOA, ILLINOIS

Quality MULTIPLE DRILL SPINDLES AND PRODUCTION TOOLS

Encircle No. 346 on Card. Opposite Page 65

# Report to

Here at Miller Fluid Power we have a pattern which we follow. A goal at which we are shooting. The pattern isn't too simple. And the goal isn't an easy one. But we've been making progress. Our position right up in the van of the industry proves that.

Our job is the production of cylinders. Basically, there's nothing anyone can do to alter a cylinder. It was old a hundred years ago. It probably won't change basically in another hundred years. But in the details of the cylinder, change is the major element.

Which is very much like industry itself. Basically industry has not changed since free enterprise was conceived on this continent. But in every detail it changes from year to year.

#### It's the Thousandths That Count

There was no single big thing wrong with the cylinders being manufactured yesterday. Just a lot of little things. So Miller Fluid Power made the improvement of little things its business.

We experimented with new materials and made safer, more dependable steel heads and caps. We hard-chrome-plated 110,000 PSI yield point steel to improve radically the piston rods. We raised the efficiency of operation to new peaks. Striving for quality in the smallest detail we improved in a dozen parts which are hidden from sight.

For instance, most cylinders leaked in operation. Miller made one that wouldn't leak. To prove it, we went away out on a limb and guaranteed leak-proof operation. And made the guarantee stand up.

#### We Learn by Listening to You

We saw our customers as thousands of men in thousands of shops wrestling with thousands of production problems. We made those problems ours and produced cylinders to whip those problems. Maybe we didn't revolutionize the cylinder busi-

Visit Miller

**BOOTH NO. 1819-1823** 

**Production Engineering** 

NAVY PIER SHOW CHICAGO

# Cylinder Users...

ness in the process. But we sure helped. We know that.

We learned to produce what we believed was the best cylinder on earth. We also learned that the best cylinder today wouldn't be good enough tomorrow. So, with the good one in production, we listened some more, experimented, and came up with a better one.

Miller Fluid Power is a young company in an old field. We are young, progressive, and willing to listen. We innovate without being prodded.

#### Discussion is a Two Way Street

On occasion we like to have others listen to us. Especially when what we have to say will help our customers. That is the idea behind our College of Cylinder Knowledge. We know a lot about cylinders. Though not as much today as we will tomorrow or the day after.

In our College of Cylinder Knowledge we try to show you what good cylinders can do for you. And what you should demand in any cylinder you buy. We meet other men who know what they want in a cylinder. We listen to their wants and try to explain what perfection in detail means.

We believe that when the users of cylinders sit down across the table from the producer who is trying to make the best, better cylinders result.

We'll be carrying that belief into the Production Engineering Show at Navy Pier in Chicago on September 6. Our College of Cylinder Knowledge booth will be open for that kind of discussion. We'll listen and learn.

The only way we can learn is from you. We can help you. But not until you've dropped that problem of yours in our lap. Your problem contains the stuff of which the better cylinder will be made. The cylinder that will have that quality plus which we like to think is the stamp of Miller Fluid Power.

Remember this when you see the sign over Booth 1819-23. We'll be there to listen to your suggestions, demands and questions. Also, because we are in the cylinder business, we'll be there to show you a cylinder you will want to buy.

Frank Flick

President

#### MILLER FLUID POWER COMPANY

2026 N. Hawthorne Avenue

Melrose Park Illinois
Encircle No. 347 on Card, Opposite Page 65

outside the tolerance limits.

When used with a suitably equipped hobbing machine, the gage automatically controls the machine both for pitch diameter and for hob shift to compensate for hob wear.

Specifications: Size of gears; from less than 1 inch up to several inches diameter; any tooth type; tolerances, adjustable from 0.0005" to 0.010" or more, each direction from mean gear dimen-

sions; tolerance adjustments directly calibrated in thousandths; repeatability of measurements better than 0.0001". Airborne Instruments Lab., Inc., Dept. BB, Mineola, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 3

#### Dial reading calipers

Eye-saving, time-saving micrometer accurate dial reading calipers are claimed to take the grief out of reading Vernier scales or graduations on a

## HORTON Tru-Set FEATURES



- Repetitive accuracy to .0002" T.I.R. guaranteed
- Rugged Meehanite bodies guaranteed for life
- Instant peripheral location 3 operating pinions
- Available up to 12" in both 3 and 6 jaw styles
- Packed in reuseable airtight metal containers

compare
HORTON
Tru-Set
PRICES

SIZE	MODEL	NET PRICE
3	3T3	47.00
4	4T3	49.55
5	5T3	66.05
6	6T3	88.90
8	8T3	128.30
10	10T3	184.15
12	12T3	222.25

Chucks listed above are 3 jaw universal type with two sets of jaws. See your Horton Distributor or write direct for new Net Price Selector

#### **HORTON CHUCK**

WINDSOR LOCKS, CONN.

# for Single or Multiple DRECISIO

on your

### SPECIAL MACHINE

The WISCONSIN Model TU-415 Automatic Lead Screw Tapping Unit is a completely self-contained assembly designed especially for precision work on your special machines.

It may be mounted in any position and is permanently sealed against coolant entry.

Safety Features provide positive protection against spindle over-travel and tap end-thrust.

Setting up and Re-setting is done easily and quickly. Versatility is assured by ready changeability of spindle speed, spindle travel and thread pitch.

Controls are built in. A reversing motor controller and initiating switch or push button operate the unit. No relays are required.

Precision Construction permits precision tapping on a production basis. Simplicity of design assures ease of maintenance, accessibility of all parts.

Write for Illustrated Bulletin



For Single Spindle Tapping, the TU-415 is furnished without guill flange and with ASA bore, adjustable adapter



For Multiple Spindle Tapping, standard equipment includes flanged guill and slotted spindles for close-coupled multiple spindle tapping heads.



WISCONSIN DRILL HEAD CO.

4981 N. 124th STREET

BUTLER, WISCONSIN

A8425-1P



micrometer sleeve.

The dial indicates 1/1000 of an inch or 1/10 mm. Caliper is made of chromium steel. Dial has Plexiglass face. For outside, inside or depth measurements. Model L141 is graduated in centimeter scale up to 14 cm; Model 142, in inches up to 5". Lux Scientific Instrument Corp., Dept. B, 935 Broadway, New York 10, N.Y.

Use ACTION Card, opposite page 64. Eneirele No. 4

Microfinish comparator

The S-22 microfinish comparator permits roughness to be specified in accordance with adopted standards on the



#### A Mechanical Eye to Watch Your Tools



# Reduce Tool Costs!

Cross Tool Control Unit
Automatically Stops
Machine When Tools



The Cross Tool Control Unit reduces tool costs, decreases machine downtime. Available in four different sizes, it can be used with most types of metalworking equipment.

Here's what it does:

- Provides continuous picture of used and unused tool life and establishes performance standards.
- ★ Decreases downtime by permitting tool changing in groups.
- ★ Reduces scrap by stopping machine before tools lose size.
- \* Reduces tool grinding costs.

Write for complete details today.

Established 1898

THE C R 0 S S

CO.

Special MACHINE TOOLS

same basis as linear measurements.

Machined finishes were formerly designated by the lower case letters f, ff, rf, etc. This was not based on any fundamental standard of measurement. One man's opinion of what surface finish was intended could be as good as another's. Recently, however, instruments have been developed for the measurement of surface roughness. This ability to accurately measure surface

roughness made possible the adoption of standard surface finish designation. Under the sponsorship of the Society of Automotive Engineers and the American Society of Mechanical Engineers a committee was formed to develop these surface finish standards.

The Baptist comparator is a surface roughness scale illustrating 22 typical machined flat surfaces capable of being produced by six different methods of

## FIRST 8-INCH METAL CUTTING SAW TO MEET TODAY'S NEEDS



## KALAMAZOO

#### **MODEL 8C**

cuts 8" round, 16" flat, 8" pipe

Kalamazoo Metal Cutting Band Saw Machines:

KALAMATIC BAR FEED for Kelamazoo. MODEL 1220 cuts 12"

MODEL 1220 cuts 12" round, 20" flet.

MODEL 610 cuts 6" round, 10" flat.

Instant-acting vise holds work-piece. Four speeds for best cutting. Accuracy easily controlled—blade action in cut easy to see. Blades changed in seconds. Automatic shut-off. All parts readily accessible. Ask your Kalamazoo dealer to demonstrate Model 8C.

MACHINE TOOL DIVISION

Kalamazoo TANK and SILO CO.

832 Harrison St.

Kalamazoo, Michigan

Encircle No. 352 on Card, Opposite Page 65

machining, and having nine roughness height values from 2 to 500 microinches (millionth of an inch). These surfaces are in accordance with Part 2 of American Standard Physical Specimens of Surface Roughness and Lay—ASA B46.2.1952, which describes surface roughness specimens for visual and tactual comparison. The roughness height values are the arithmetical average deviation from the mean surface

expressed in microinches.

The comparator is composed of individual specimen blocks which are accurately machined from stainless steel to the specified standard finishes, These blocks are mounted in the master pattern against which electroforms are made. The result is the negative surface of the master. Baptist Machine Co., Inc., Dept. B, 703 Pacific St., Stamford, Conn.

Use ACTION Card, opposite page 64. Engirele No. 5

# METAL STAMPING SERVICE AT LOWEST POSSIBLE DIE COST

FIRST...In Experience • In Know-how

- In Research In Quality
- In Service

The sketch briefly describes the cost of a typical part made for one of our thousands of customers.

We have a short run stamping service to offer beyond comparison.





\$57.50 for first 100 pieces including tools. \$5.50 for each additional 100 pieces plus material.



Factory trained representatives in all centers. Write for full details.

DAYTON ROGERS

Manufacturing Company

MINNEAPOLIS 7C, MINN.

Encircle No. 353 on Card, Opposite Page 65

#### Spring guards for high production dies



A safety device to prevent pinched fingers and damage caused in the event the spring retaining nut works loose, the Motorol Engineering Co., Dept. BB, 8414 W. McNichols Rd., Detroit 21, Mich., provide spring guards in two



diameters and seven different lengths as a standard item. Triangular flange allows a minimum center distance between springs.

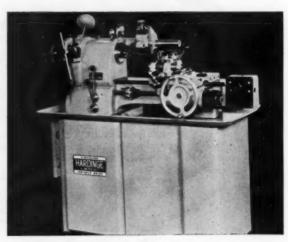
Use ACTION Card, opposite page 64. Encircle No. 6

#### Chucking Machine Features 3-Selector Variable Drive

Increased production, wider range, and ease of operation are claimed for the new Hardinge Model HCT and HC chucking machines with 3-selector variable drive.

A three-position speed control lever at the headstock permits the operator to shift instantly from one speed to another without stopping the machine. Any three separate speeds within the 125 to 3000 rpm range of the machine may be preselected by adjusting master cams located inside the motor

compartment door. After presetting the speeds, it is only necessary for the operator to move the top speed control lever at the headstock of the machine



from one speed position to another and get the desired speed. Hardinge Bros., Inc., Dept. B, Elmira, N. Y.

Use ACTION Card, opposite page 64. Encircle No. 7



Heavy Duty Vertical Milling Attachment

# Heavy duty attachments increase versatility of dependable, low-cost

# **GREAVES MILLS**

"THE MOST MILL FOR THE LEAST MONEY"

A full line of attachments and accessories offer outstanding flexibility for all types of milling operations . . . with GREAVES MILLS.

Make your own comparison of 22 specifications of Greaves and 7 other leading milling machines.



Heavy Duty Offset Vertical Milling Attachment



**Universal Milling Attachment** 



**Rack Milling Attachment** 



GREAVES MACHINE TOOL CO. 2600 Eastern Avenue, Cincinnati 2, Ohio

Send Comparison Chart. I will make my own comparison of GREAVES MILLS with other makes.

Send information on Attachments and Accessories for GREAVES MILLS.

Send coupon for FREE Comparison Chart and detailed descriptive literature, on easy-to-use attachments.

NAME		. TI	TLE	
FIRM	-			
ADDRESS		2.		
CITY		ZC	NE STATE	

#### Toolmakers' microscope measures to .0001"

The Scherr toolmakers' microscope permits the precision measuring of coordinates to .0001", angles to 1 minute of arc, in addition to radii, concentric circles, screw threads. Optics are furnished by E. Leitz, Inc., Wetzlar, Ger-

The measuring stage has a range of 11/2" x 2" with 1" large micrometer drums reading in .0001". The additional movement in both directions is obtained by the use of gage blocks. An unusual feature of this instrument is the ability to interchange oculars very quickly, as a variety of ocular heads are available for angular measurements to one minute of arc, concentric circles, and screw threads, in addition to standard hairline



cross oculars. The George Scherr Co., Dept. BB, 200 Lafavette St., New York 12. New York.

Use ACTION Card, opposite page 64. Encircle No. 8

Users develop own production units with variation of components

These two front and rear views show four of the units recently incorporated by the Standard Electrical Tool Co.. 2486 River Rd., Cincinnati 4, Ohio, in a continuous wire brushing and grinding operation.

Standard's endless variation of com-



ponents, consisting of slides, feeds, tables, super precision spindles, is claimed to permit a user to develop his own production unit, whether it involves single or multiple attachments.

Upper illustration identifies the assembly of a super precision spindle with belted motor drive assembled as a unit on a vertical angle plate feed. Cyclical reciprocation of the spindle is accomplished with an air or hydraulic cylinder assembled on a vertical slide to permit positioning of the wheel on centers. The spindle housing, or bracket design, allows for quick interchanging of spindles for the individual application. While equipped with micrometer hand adjustment, the slide is available with anti-friction ways and hydraulic cylinder.

Use ACTION Card, opposite page 64. Encircle No. 9

Spiral fluted taps available in four styles

The Sossner Tap & Tool Corp., Dept. BB. Lynbrook, Long Island, N.Y., has announced recent additions to its line of spiral fluted taps, making possible a broader range of application for this style of tap and eliminating some of



In Chicago...
you'll see for the first time

# A NEW LINE OF GISHOLT MACHINES

this medallion:

The new Gisholt MASTERLINE medallion identifies this new and improved series of machines—and re-emphasizes Gisholt achievements in building the master tools of industry since 1887.



Based upon nearly 70 years of specialized experience, the new Gisholt MASTERLINE machines are ready to give you production far in advance of their time.

Come in and inspect them at close range. Watch them operate. Learn what these new Gisholts can do to cut costs on your work.

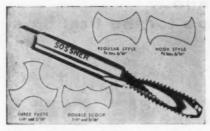
Be sure to visit the Gisholt exhibit—Booth 1413, Exhibition Hall.

GISHOLT

ACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES . AUTOMATIC LATHES . SUPERFINISHERS . BALANCERS . SPECIAL MACHINES



the problems heretofore encountered in their usage.

In machine screw sizes and in ¼" and 5/16" fraction sizes two styles of 2 flute spirals are available: regular

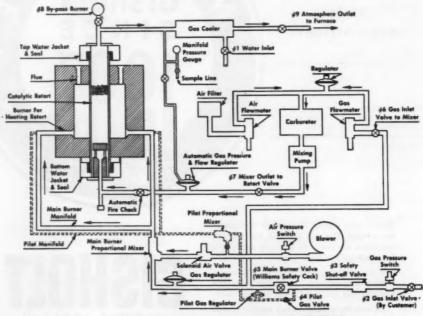
style for general purpose work on nonferrous materials, and hook style where a more free cutting action is desirable.

Three flute spirals in ¼" and 5/16" fraction sizes are available for applications such as ferrous materials where extra strength is desired. A "double scoop" design is offered in ¼" and 5/16" sizes. This style is claimed to afford extremely free cutting action due to a combination of narrow land, wide flute, hooked cutting face and chip breaker effect; recommended for difficult applications such as deep blind holes and for clinging materials like copper.

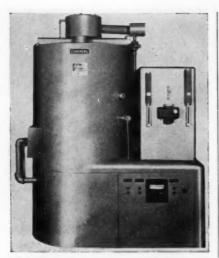
Use ACTION Card, opposite page 64. Encircle No. 10

#### Gas Cracking Generator Produces Atmosphere for Hardening, Annealing, Brazing

A new streamlined endothermic atmosphere generator, completely wired, piped, and assembled in a package unit, is now offered by Lindberg Engineer-



FLOW DIAGRAM FOR HYEN GENERATOR



ing Co., Dept. B, 2450 W. Hubbard St., Chicago, Ill. The Hyen Hydryzing generator is a fully automatic process for producing low cost protective atmosphere for bright hardening, bright annealing, or bright brazing of steel free from decarburization or carburization. Available in 500, 750, and 1500 cfh sizes, the unit provides production economies and gives better, more precise operation, the manufacturer claims.

Design features include: instrument panel combined with generator; main components of mixing machine panel mounted at waist level for easy adjustment; carburetor quickly cleaned without the aid of tools; larger catalyst bed increases cracking efficiency; standard ceramic retort interchangeable with high alloy inconel retort when intermittent operation of generator is required.

Use ACTION Card, opposite page 64. Encircle No. 11

#### Drillpress has magnetic starting

A heavy duty column type drilling machine with capacity of 1¾" in cast iron and 1¾" in steel, Alzmetall Model AE4 incorporates magnetic starting, infinitely variable control of spindle speed

THRIFTMASTER your source for dependable

DRILLHEADS

Universal Joint Type Drillhead . . Full Ball or Gronze Bearing Construction, Standard or Heavy Duty. From  $V_2$ " minimum centers up. Capacities to  $V_2$ " in Steel.





Single and Double Eccentric Type Adjustable Drillhead . . Enclosed, Full Ball Bearing Construction. New Double Eccentric Type illustrated.

Special Fixed Center Drillhead . . . Made to your requirements. Full Ball Bearing Construction.



- We stock or can build the right drillheads for your jobs.
- Write for your free copy of the THRIFT-MASTER CATALOG or phone for a rush, on-the-spot quote.



Encircle No. 356 on Card, Opposite Page 65



DISSTON BITE-RITE® AMERICAN PATTERN FILES Sharp teeth cut level and smooth, eliminate tracking. Special Bite-Rite design assures clean, open gullets—better finishing, faster work.

DISSTON SUPERFINE® SWISS PATTERN FILES For easier, more accurate filing of intricate shapes . . . also for bench filing requiring bench and parallel machine files.

DISSTON HAS THE EDGE IN METAL-CUTTING BAND SAWS Long-lasting, hard-edge, flexible-back band saws cut smoothly through metal, plastics, and wood. Supplied on Disston Safety Reels in 100 coils.

Order these Disston tools from your dependable Disston Distributor—a reliable source for expert advice, prompt service.

MENRY DISSTON & SONS, INC. 3849 Tacony, Philadelphia 35, Pa.

Other factories and branches: Toronto, Ont.; Seattle, Wash.; Chicago, III.



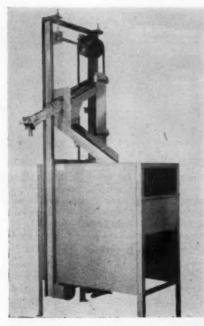
in both high and low range, includes three automatic as well as manual feeds, and optional equipment which includes automatic tapping.

Spindle speed range is from 80 to 700 rpm, other speeds optional; automatic feeds are 0.004, 0.007, and 0.012 ipr. The No. 4 Morse taper spindle has a travel of 67%". Capacity for handling large workpieces is provided by the 27" swing. The headstock is completely enclosed and all gears run in an oil bath. Alzmetall, United States Office, Dept. BB, 30 Church St., New York City 7.

#### Automatic parts feeder holds 6 cu. ft. of parts

Model C floor type automatic parts feeder manufactured by Cook & Chick Co., Dept. BB, 640 S. Miller St., Chicago 7, Ill., selects and feeds parts automatically to various production machines such as grinders, welding machines, assembly machines, punch presses, machining operations, etc.

The large hopper capacity (6 cu. ft.) makes it especially suitable for use in automatic setups where frequent loading of small capacity parts feeders is



not practical and for feeding larger parts.

Delivery track furnished to suit user's requirements; made with either right or left hand feed. Variable speed drive regulates feeding rate. Air escapement for releasing one part at a time furnished where required.

Use ACTION Card, opposite page 64, Encircle No. 13

# Flexible shaft machine has swivel mounting

A multi-speed, low pedestal-type flexible shaft machine, Model M50, has a swivel mounting and a wide rugged base with large casters, making it easy to move over rough floors.

It can be operated at four different speeds, 1150, 2100, 3450, or 5750 rpm and is furnished with a 6 ft. flexible shaft. Speeds can be changed easily with an eccentric countershaft. It is available with either <sup>3</sup>/<sub>4</sub>, 1, 1½, 2, or 3 hp motors. Belt and pulleys are completely guarded.



### 18 MODELS

Maximum offset with Maximum Accuracy

More Flynn Boring Heads are in use today than any other make because their quality and many design features that make them easier to use and longerlived appeals to machinists.

Write for catalog



# Keep a Close Check On Accuracy With SUNDSTRAND Bench Centers



Simplify assembly, lower spoilage and get better production from this modern Sundstrand Bench Center. You'll check work between centers easier, faster and within limits of .0001" on this improved Sundstrand Bench Center.

"One-hand control" over all movable elements leaves the operator's other hand free to control rotation of the part being checked. Either headstock or tailstock can be unclamped, positioned and locked in place with a single hand operating the top lever. Investigate this bench center today.

### **Complete Range as Follows:**

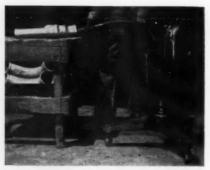
6" x 18"	12" x 48"	24" × 48"
6" x 36"	12" x 60"	24" x 60"
12" x 36"	12" x 72"	24" x 72"

### FREE Additional Data



covering complete specifications and additional features is contained in this bulletin. Write for your copy. Ask for data sheet 459.





Machine can be used with grinding wheels, buffing wheels, sanding discs, sanding drums, wire brushes, and drills. Stow Mfg. Co., Dept. BB, 30 Shear St., Binghamton, New York.

Use ACTION Card, opposite page 64. Encircle No. 14

### Transfer punch sets

The location of tapped, threaded, drilled or reamed holes may be transferred with Spelmaco Spotters, precision transfer punches packaged as a matched set and supplied in a standard drill stand.

The correct size of punch is selected,



inserted in hole and tapped lightly with a hammer. Sizes increase by 1/64" from 3/32" to 17/32". Punches are all 4%" in length. Each unit is .002" undersize to facilitate use. R. L. Spellman Co., Dept. BB, 314 E. Court St., Urbana, Ohio.

Use ACTION Card, opposite page 64, Encircle No. 15

# New RACINE

8" x 16" UTILITY METAL CUTTING MACHINE

Large Capacity Low Cost

- Adjustable Hydraulic Feed and Control
- Adjustable Stock Gauge
- Adjustable
   Height Gauge
- Large Coolant System
- No Levers,
   Springs or Clutches
- Fast, Accurate Economical Operation



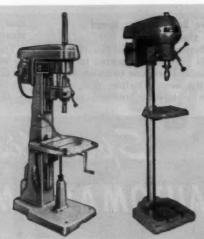


the important features of wide utility and large capacity. It will handle the full range of general cut-off work from tough tool and dies to mild bars, tubing, and structural shapes up to 8" x 16". A limit switch makes it possible to employ and efficient drive, eliminating the need of a clutch. At the completion of each cut the motor is stopped and the saw frame automatically rises to the highest point. Write us about your metal-cutting needs and complete Racine Saw Catalog. Address RACINE HYDRAULICS and MACHINERY, INC., 2054 Albert St., Racine, Wisconsin.

Encircle No. 360 on Card, Opposite Page 65

# TESTS THE NEW CINCINNATI DRILLS. YEAH, BUT HE'S GOT THE THAT NEW STEP UP, BOYS, NEW IT-SPEED 16" SLIDING AND PLACE YOUR BETS! THEY'RE ATTACHMENT HEAD DRILL ON THE NEW 16" GOES UP TO 3100 R.P.N ROYAL! OFF! J.R. WILLIAMS center on





Even Lathedog appreciates the money-making possibilities of these two new Cincinnati Drills. And the new 16" Royals and 16" sliding head drills look every bit as good as they run. They're styled to dress up your shop and make it a real metalworking showroom.

With new styling and precision come great new features. New, built-in power feeds give you the production advantages of automatic operation at slight extra cost. New, built-in electrical and mechanical controls on both models give you ease of operation never before possible. New, rugged construction and built-in belt guard add operator safety to performance and appearance.

Whatever your drilling needs, be sure to see these great new models at your local CL&T dealer's showroom. For catalogs D-134, D-138 and price information, plus the name of the CL&T dealer nearest you, write: CINCINNATI LATHE AND TOOL CO., 3257 Disney, Cincinnati 9, Ohio.

# lathes and drills



available for framing.

# Abrasive belt grinder speed 10,000 sfpm

The Superspeed Model No. 150 abrasive belt grinder is reported to be the first standard machine to utilize Superspeed, the new principle of operating abrasive belts at a tremendous speed

said to be in excess of 10,000 sfpm—about 120 miles per hour.

The grinder uses standard 1½" wide by 60" long abrasive belts and features a belt changing and automatic tensioning device which also provides automatic tracking of the belt, without fur-

# Specialists in AUTOMATIC MACHINES

500 B MACHINE PRODUCTS INC. ERIE, PA.

# Since 1919

Swanson offers a fully integrated organization experienced in engineering and building special automatic machines for machining, processing and assembling small and medium parts. Swanson machines have improved quality and lowered costs in a wide range of manufacturing operations. If you have a problem in automation, we'd like to help.

 Your inquiries will be treated in confidence... our recommendations submitted without obligation.

SWANSON TOOL & MACHINE PRODUCTS, INC. 814 East 8th Street • Erie, Pa. • Phone 2-6763

# **CHAMFER or DEBURR GEARS and SPLINES** the LOW Cost SHEFFIELD WAY

The ends of goor feeth or splines of all kinds are deburred, chamfered, recessed or precision formed to your requirements at high production rates by these Sheffield machines.





340 Series Machines Chamfer or Deburr: 120 Gear Teeth per Minute using a Hollow Mill 60 Gear Teeth per Minute using a Pencil Cutter





380 Series Machines Deburr: 250 Gear or Spline Teeth per Minute using a **Reciprocating Chipper Tool** 



370 Series Machines Deburr:

250 Spline Teeth per Minute using a Flytool,





350 Series Machines Deburr:

300 Spiral Bevel or Hypoid Teeth per Minute, both sides simultaneously using Two Flytools





Gear Deburr Grinder removes burrs from 1200 Spur or Helical Gears per Hour





For descriptive literature on this equipment w Div. 810, The SHEFFIELD CORPORATION, Day









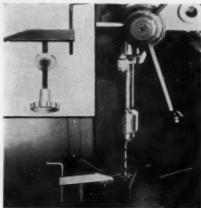
ther adjustment.

Bench and pedestal models, equipped with either % or 1 hp, 115 v or 230 v, single phase or 34, 1 or 2 hp, three phase. Anchor Machinery Co., Dept. BB, 229 W. Orange Grove Ave., Burbank, Calif.

Use ACTION Card, opposite page 64, Encircle No. 16

Drill press clamp improved

The Hunter Tee drill press clamp now has a taper on the end of the hold down bar, which enables it to be used in close quarters. Another new feature is the V notch which has also been placed on the bottom part of the hold down bar. This notch makes it easier to grip round and oddly shaped material. Hunter Tools, Dept. MBB, Whittier, Calif.



Use ACTION Card, opposite page 64. Encircle No. 17



ONE tool holder for all positions . . . No tool chatter . . . can do internal boring or internal threading ... Ideal for carbide tools . . . Bit sizes: 14", 5/16", 3%", 7/16", 1/2". 5/8".

ACME TOOL CO. 71 WEST BROADWAY NEW YORK 7, N. Y.

Encircle No. 364 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



FREE CATALOG

contains valuable engineering information and rivet specifications plus illustrated descriptions of 26 Chicago Automatic Rivet Setters.



9610 West Jackson Boulevard, Bellwood (Chicago) Illinois Branch Factory: Tyrone, Pa.

# BOOBBORD



# **POWERFUL** DRIVING P

COMPACT DESIGN

SMOOTH ENGAGEMENT

UNIFORM PRESSURE

FINE ADJUSTMENT

ACCURATE BALANCE

LONG SERVICE LIFE

\* The toggle action goes "over center", locking POWERFUL PULL \* the clutch in driving position; providing powerful pull. Operating pins, links and rollers are hardened steel. The strong, symmetrical body is accurately machined, as are the release sleeve and bearing.

Send for This Handy Bulletin

Shows typical installations of ROCKFORD

CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes

capacity tables, dimensions and complete specifications.

















BORG-ROCKFORD CLUTCH DIVISION A 1309 18th. Avenue, Rockford, Illinois, U.S.A. A

COOOCE

Encircle No. 366 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK

# Try these lightweight...speedy PORTABLE TOOLS

- Produced in the industry's most modern, air-conditioned plant to give you top precision.
- Gives you advanced features for faster production, easier handling.
- Backed by Rotor Tool's 25-year reputation for applying the right tool for your job.

Ask for a demonstration of any of these tools.

See how they can cut your costs!

Special bulletins on all tools on request.



Rammers



High Cycle Tools

Screw Drivers

# Stillson pattern added to wrench line

The Billings & Spencer Co., Dept. MTBB, Laurel St., Hartford, Conn., has added the Stillson pattern wrench to its line.

Drop forged from specially selected steel, the wrenches are made in six



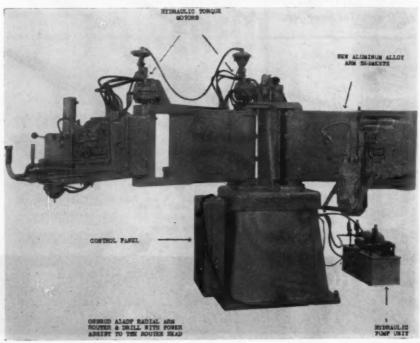
different sizes ranging from 6" to 24" in length.

Use ACTION Card, opposite page 64. Encircle No. 22

### Radial Arm Router Equipped with Power Assist

The new radial arm router designed by Onsrud Machine Works, Inc., Dept. B, 3900 W. Palmer St., Chicago 47, Ill., is available with power assist which uses hydraulic motors at each pivot point, controlled by a hydraulic valve which controls the rotation of the pivot shafts in the direction selected by the operator. Other improvements are: redesigned arm segments now made of aluminum; motor slide stroke increased from 4" to 6"; improved lifting control mechanism for the cutting units; cutter motor increased from 5 to 8 hp, and Norgren micro lubrication.

Use ACTION Card, opposite page 64. Encircle No. 23



### Adjustable tapping and drilling head

A universal joint adjustable tapping and drilling head has been announced by the Errington Mechanical Laboratory, Inc., Dept. B, 24 Norwood Ave., Staten Island 4, N. Y.

It reportedly takes less than 1/2 minute to change head from drilling to tapping or tapping to drilling. It is adjustable to any pattern of holes and is available with 4 or 6 spindles.

The tool is available in two sizes, No. 0-0" to 1/4" tap capacity, min.



# HIGHER SPEEDS! FASTER GRINDING

MODEL JA 50,000 R.P.N

> Weight 12 ounces; length 634 inches; chuck size 1/4 inch. Wheel guard removed for better illustration.

The RPM's stay up while grinding . . . not only when the grinder runs idle. That means better work-longer wheel life.

High speed grinding with small wheels was a Madison-Kipp development of the late twenties. It was born out of a pressing need in our tool room. Because tool room grinding problems are universal, we believe it will pay you to utilize Kipp grinders in your tool room as generally as we do in our own.

MADISON-KIPP CORP.

207 Waubesa St., Madison 10, Wis., U.S.A.

centers 11/16", max. pattern 5¼", No. 1—7/32" to ½" tap capacity, min. centers 1½", max. pattern 8".

Use ACTION Card, opposite page 64. Encircle No. 30

# Drill press attachment cuts multiple splines and flutes

Multiple splines, spiral flutes, squares, hexagons, etc., can be cut at production rates on any standard drill press with a milling head announced by Modern Manufacturing Co., Dept. B, Edgemont and Clementine Sts., Philadelphia 34, Pa. The head is said to cut from 2 to 12 splines within commercial tolerances in one operation at an average rate of less than three minutes per finished piece.

It may be used as a single unit or in a series on multiple spindle lathes or presses. The head operates equally well in a vertical, horizontal, or angular position and mills straight or spiral splines in either direction at a maximum or minimum pitch. It also mills straight



or spiral flutes, right or left hand, for taps, end mills, counter bores, spot facers, reamers, etc.

The head is provided with 12 adjustable cutters geared through a taper shank drive attached to the drill press. When used on engine or turret lathes for continuous flute work, attachment





# CAMPBELL Abrasive Cutting is **SMOOTH** cutting -high quality at low cost

Testing procedure by CAMPBELL every type of cutting operation.

• Almost any type of material. Engineers will show conclusively whether hard or soft, can be eco- which abrasive cutting machine will nomically cut by CAMPBELL Abra- do the most economical job on your sive Cutters. The excellent finish cutting application. Latest type obtained eliminates milling or other CAMPBELL machines are available finishing operations in most cases. to save you time and money on



Let us send you Bulletin DH-301 on "Principles of Abrasive Cutting"

**Campbell Machine Division** AMERICAN CHAIN & CABLE

937 Connecticut Avenue, Bridgeport 2, Connecticut



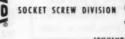
# UNBRAKO AT WORK



BUTTONING UP THE JOB PROP-ERLY. UNBRAKO Button Head Socket Screws, of course, provide a smooth, streamlined surface. They are strong, too. But equally important is the ease with which they can be inserted and withdrawn without marring the socket of the screw or the surface of the assembly. For the complete UNBRAKO story, see your authorized industrial distributor. Or write STANDARD PRESSED STEEL Co., Jenkintown 52, Pa.









is made by a hollow spindle. This model has a capacity for %" to 11/4" diameter stock. Special models to handle up to 5" diameter stock are available on contract.

Use ACTION Card, espesite page 64, Encircle No. 31

### Tapping machine has forward and reverse electromagnetic clutches

The Ettco-Emrick A.T.U. No. 3 automatic lead screw tapping machine is a self-contained electrically controlled and operated device for single and multiple spindle tapping or threading. Electricity is the only power required.

Utilizing a new principle of forward and reverse electromagnetic clutches, the machine needs no reversing motor and can be operated at extremely high speeds, it is claimed. A built-in rheoatat control mounted on the side of the machine permits the torque of the clutches to be regulated over a range of from



### **COMTORPLUG** with interchangeable expanding plugs to gage simple or special bores from 1/8" to 8" dia.

### Unique Advantages

- Positive gaging accuracy to fraction of .0001" regardless of who operates
- · Indicates actual size, a fixed-net passing—reading.

  Positive 2-point gaging—automatic
- Positive 2-boint gaging—automatic centering.

  Shallow holes, deep holes, inside splines, open-end holes gaged easily.

  Detects ovality, back or front taper, bell mouth, barrel shape.

  Reaches to bottom of blind holes.

  Gages work while still held in chuck.

  A shop tool for all-day every day
- use. Pertable-no wires, hoses or stands.

Investigate the gage used by the thousands in jet engine, automotive transmission, household appliance, farm machinery, guided missile and other volume-precision plants. IT MAKES PRE-CISION GAGING EASY . . at machine . . . at inspection bench . . . for se-lective assembly. No other like it for seinvestigate and see why.

COMTOR COMPANY 62 Farwell St. WALTHAM 54, MASS.



GET THE FACTS-REQUEST BULLETIN 48



# Wilson "Tukon" Micro Hardness Testers



for Micro and

Macro Hardness testing

A model for every range of pyramid testing



Model F8—Floor model for Micro Hardness testing only

Model MO—Table model for Micro Hardness testing only

# These "Tukon" models meet every fine test requirement

• WILSON "TUKON" Micro Hardness Testers are unexcelled for testing metallic and non-metallic parts where minute indentation and extreme accuracy are necessary. All use both Knoop and 136 degree Diamond Pyramid Indentor.

Selection of the model for your

requirement depends on the type and thickness of work to be tested, range of loads, other hardness testing equipment available and whether a combination of micro and macro hardness testing is required. Write for Booklet DH-114 on WILSON "TUKON" Micro and Macro Hardness Testers.



**Wilson Mechanical Instrument Division** 

AMERICAN CHAIN & CABLE

230-T Park Avenue, New York 17, N. Y.

WILSON
"ROCKWELL"
end "TUKON"
Herdices
Testers







The Multi-Purpose Machine

For use in Straight, Circle, and Free Cut-ting. Beading. Offsetting, Forming, Nib-bling, Slotting, Louvering, Stretching, Shrinking, Etc.

TECH-PACIFIC 2811 LAFAYETTE

264

For literature or Information write:

NEWPORT BEACH, CALIFORNIA

Encircle No. 375 on Card, Opposite Page 65

0 to the equivalent of 2 hp. This gives the machine the sensitivity required to protect small taps and the power and torque needed to drive the larger taps. Since the clutches are energized within themselves there is no end pressure on either lead screw or taps, thus producing a thread that is as accurate as the taps or dies being used.

An external depth control knob allows the tap depth to be controlled to within 1/4 turn anywhere within the maximum stroke of 17/8".

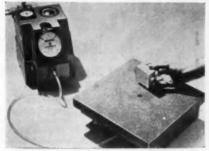
Available motor drives include direct mounted fixed speed motors; direct mounted variable speed motors; direct mounted variable speed geared type motors. The machine can also be supplied with single or multiple pulley drives. Tap speeds can be designed to

MACHINE and TOOL BLUE BOOK

suit the requirements. Capacities cover a range of from No. 0 to the equivalent of 2 hp. Ettco-Tool Co., Inc., Dept. MTB, 594 Johnson Ave., Brooklyn 37, N.Y.

Air flatness gage

A rapid and accurate method of checking surface flatness through the



medium of air gaging is provided by a new gage being manufactured by Federal Products Corp., Dept. B, 1144 Eddy St., Providence, R.I. This gage, Model A-582 B-4, has two essential parts. One is a Federal Dimensionair air gage, equipped with a universal air gaging spindle known as the AirProbe. The second part is a Rahn black granite surface plate. The surface plate regularly furnished is 12" x 12" x 3" and has a guaranteed accuracy of .000050" for any 2' x 2' area. Plates of other sizes or accuracies will be furnished on request.

To check flatness, a part is placed on the surface plate and moved across the contact point. Any variation in the surface will depress the spindle a different amount and this difference can be read on the Dimensionair dial in increments of .000050" or .000020", depending on

which model is used.

The AirProbes can be supplied in ranges of .003", .006", .015" and .030" to suit various tolerance ranges. The gage can also be used as a height or depth gage by the addition of special Air-Probes with longer contact points.

Use ACTION Card, opposite page 64. Encircle No. 35



100% guaranteed!

# repeats to .OOO1" in 30 seconds

### ONLY DEKA-BORE

DEKA BORE

Offset Boring Head
 Can be adjusted in fractions of 1/10,000" on the full diameter as easily as reading 1/16" on a steel rule. Not a vernier or scroll adjustment.

 Can be calibrated in increments of .00005 on radii or .0001 on diameter as easily as picking up .002 on a conventional micrometer dial.

Attach this ad to your letterhead and mail for a free demonstration or literature!

PRECISION TOOL & MFG. CO. OF ILL.

1305 S. Laramie Ave., Cicero 50, Illinois

MT.S

# Your wiping problems increase in hot weather..



another reason for switching to Scott Wipers

This remarkable new product protects men and metal...steps up efficiency all year around!

Because a fresh one is always available—Scott Wipers provide a constant source of clean wiping material.

Scott Wipers are sanitary and disposable.
They end the laundering problem . . .
simplify distribution and control.

Compare them with whatever wiping material you're using now—for cost, convenience, performance.

The Scott representative or distributor in your area stands ready to help you set up a production line demonstration in your plant. Call him or mail this coupon today.

And, best of all, Scott Wipers are DISPOSABLE!



SCOTT Dept. 1 Please send

SCOTT PAPER COMPANY

Dept. MT-C. Chester, Pa.
Please send me full information on
Scott Industrial Wipers.

Name\_\_\_\_

Company

Address

# HOW SQUARE HOLED SLEEVES

One of the most difficult problems in tool making can be solved easily and quickly with Sturdy Square Holed Sleeves. The perfection of broached square holes can be had in boring bars, milling cutters and many other applications at a small

many other applications at a small fraction of the cost of imperfect hand-made square holes. The Sturdy Square Holed Sleeve consists of a round sleeve with a perfectly square hole broached through the center. This hole is tapped at one end to receive a back-up screw which is furnished with the Sleeve. The Sleeve can be sweated or pressed into a drilled and reamed hole to make a perfectly square accurate hole in a very few minutes.

The Sturdy Square Holed-Sleeve will save you many hours and many dollars in the making of boring bars, tool holders and other tools requiring square holes.

SLEEVES MADE IN THE FOLLOWING SIZES: 3-16, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 1"

STURDY BROACHING SERVICE, INC.
23516 TELEGRAPH ROAD DETROIT 19, MICH.



Patents Pending





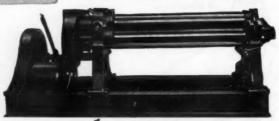
Encircle No. 378 on Card, Opposite Page 65

# Beloit

# BENDING ROLLS

Sheets and plates are quickly formed into cylindrical shapes with this efficient, hard working Beloit Bending Roll. Built for years of trouble-free service. Easy to operate. Rolls are of slip type. Hinged housings permit speedy removal of completed cylinders. Reversing lever places machine in readiness for the next job. Do forming quicker easier and at lower cost with Beloit equipment.

Beloit Equipment will cost you less and serve you better.



Picture shows a member of the famous Beloit line which also includes Punches, Shears Rod Cutters, Notchers, Bending and Straightening Rolls.

Write for complete details

HENDLEY & WHITTEMORE CO.

100 Blackhawk Blvd.

Beloit, Wis.

Encircle No. 379 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

### Gear line expanded

Three horsepower right angle bevel gears and two-to-one ratio units have been added to the line of Anglgears produced by Airborne Accessories Corp., Dept. B, Hillside, N.J.

Anglgear Models R-340 and R-350 have been uprated from 2½ to 3 horse-power. The 2:1 ratio gears are now furnished in all sizes and models of the line.

Line now includes both 1:1 and 2:1 gears in 1/3, 1 and 3 horsepower units. Units are furnished with two or three shaft extensions. May be used either in power transmission or in manually operated assemblies.

Use ACTION Card, opposite page 64. Encircle No. 36

### Recessing tools available from stock

Boyar-Schultz Corp., Dept. BB, 2000 S. 25th Ave., Broadview, Ill., has announced a line of recessing tools avail-

CINCINNATI 4, OHIO

# IT'S SAFER TO BUY DRILL HEADS, FIXTURES and BUSHING PLATES AS A COMPLETE PACKAGE

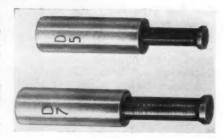


Encircle No. 381 on Card, Opposite Page 65

able from stock.

Although applicable to a wide variety of screw machine operations, they are most commonly used to groove the i.d. and to recess the back end of a piece part before it is cut off to save a separate burring operation. They are adaptable to multiple spindle equipment if the holder used will fit the shank size of the tools.

Four sizes are offered: "A" for holder

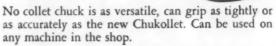


Need a <u>really</u> accurate collet chuck?
Before you buy **COMPARE** the new
HANCOCK Ball-Bearing CHUKOLLET

with any collet holder.

7488888888888

COMPARE for accuracy!
COMPARE for versatility!
COMPARE for gripping power!
COMPARE set-up time!
COMPARE price!



No other collet chuck has an adjustable stop for positive axial location to .0005 inch! 5 C collet is not drawn in while closing.

See for yourself. Make a test in your own shop next time you have a job that demands the ultimate in axial and radial accuracy. Remember, Chukollet is guaranteed. Money refunded in 30 days if not completely satisfied! Send for literature today.

Manufacturers' agents and dealers, several territories available. HANCOCK MFG. CO.

Santa Clara, Calif.

Pand.

with ¼" hole; "B" for holder with 5/16" hole; "C" for holder with %" hole; "D" for holder with ½" hole.

Use ACTION Card, opposite page 64. Encircle No. 37

# Rubber bonded abrasive wheel grinds, sands, polishes, deburrs

Neoprene rubber bonded to a cast aluminum wheel provides an abrasive wheel, the All-Four, which is designed to perform equally well the four basic abrasive functions of grinding, sanding, polishing, and deburring. The wheel is effective on wood, metal, plastic, and rubber.

Live rubber base serves as a cushion under the abrasive cloth as well as preventing slippage. A special locking device is claimed to end abrasive cloth fly-off. C. R. Vogt and Co., 1528 - Third Ave., Moline M23, Ill.

Use ACTION Card, opposite page 64. Encircle No. 38



# **High Speed Production**

Grinding DEMANDS

High speed production grinding has made just coolants obsolete! Today's water-mix grinding fluid must provide lubrication, heat dissipation qualities. anti-rust protection and balanced surface tension. If you're using "just a coolant", it's costing you extra money!

Stuart's CODOL is a carefully designed liquid grinding compound that is far more than just a coolant. CODOL has been scientifically compounded to provide far more detergency than ordinary water-mix grinding fluids. Wheel loading is greatly reduced and allows more pieces to be ground per wheel dressing.

CODOL's carefully balanced surface tension insures the carrying away of chips and abrasive particles from the wheel, work and machine. Surface finish is improved, production is increased and good wheel life is obtained.

To be sure that you consider all of the important points, such as ease of mixing, resistance to rancidity, gumming and foaming, when selecting a watermix grinding fluid, ask "the Man in the Barrel", your Stuart Representative, to call and help you. And write today for your copy of the Stuart Water-Mix **Cutting and Grinding Fluid** book.

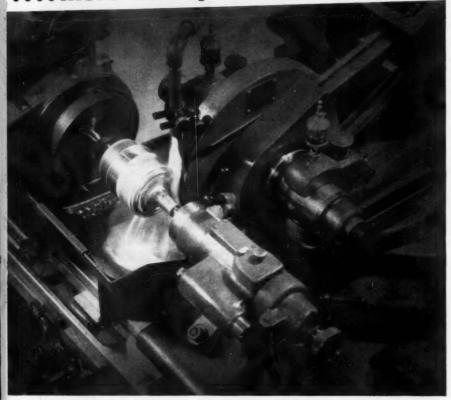
D. A. STUART OIL COMPANY, LTD. 2749 S. Troy St., Chicago 23, III.

## More than a "Coolant" is Needed

Plants in: Chicago, Detroit, Cleveland, Hartford, and Toronto, Ontario.

Branch Warehouses and Representatives in principal metal working centers in the United States, Canada and Europe.

.... more than just a coolant.....





Stuart Oils

**Time Tested Cutting Fluids and Lubricants** 

### **Advertising Inquiry Response System**

The "Exact" system for control of industrial advertising inquiry response and prospect follow-up can be handled entirely on the clerical level.

A six-part, one time carbon form is said to provide check list spaces for all information an inquiry normally carries, and to set this information up for subsequent referral and follow-up. Primary classification by the sales manager enters the inquiry into a process which includes sameday inquiry response, referral to the proper salesman or dealer, fol-



low-up letters to prospect and re- minders to salesman at pre-determined



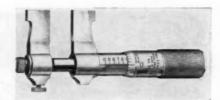
intervals, and referral back to the sales manager should prospect reach a "buying mood."

The system also provides for removal of the prospect from process when a sale has been completed or when certain other conditions cause him to lose the status of prospect. Accruing also through the system's use are data relative to advertising effectiveness, cost of advertising per dollar of sales, dealer performance, percentage of inquiries converted to sales, relative strength of various advertisements, publications, direct mail pieces. Advertising Controls, Inc., 2330 Victory Pkwy., Space 303B, Cincinnati 6, Ohio.

Use ACTION Card. opposite page 64. Encircle No. 47

# Inside micrometer caliper has 1"-2" range

The Starrett No. 700 inside micrometer caliper combines the quick-reading features of a micrometer with Vernier



caliper-style jaws. It has a range of 1" to 2" by thousandths of an inch. The jaws are hardened and ground on a radius. Satin chrome finish eliminates glare and eye strain. The L. S. Starrett Co., Athol, Mass.

Use ACTION Card, opposite page 64. Encircle No. 48

### New Lathe Added to Line

The line of American Pacemaker lathes has been expanded by the addition of a new size, the 32" Style H, to bridge the gap between the 25" and 32" heavy duty sizes. It is adapted to a sizeable percentage of conventional 32"



Visit Us In Booth 411 - Sept. 6-17, 1955 - Machine Tool Show, Chicago

Encircle No. 385 on Card, Opposite Page 65



WASTE NO MORE TEARS

On Boring and Facing Problems

CHANDLER DUPLEX
Is Made in Six
Sizes—All Have
Power Feed for
Facing

· A Boring Head that Won't Face is Not Complete

Model

Write Today for Complete Details

CHANDLER TOOL COMPANY, MUNCIE, INDIANA

Chandler-Duplex

Encircle No. 386 on Card, Opposite Page 65



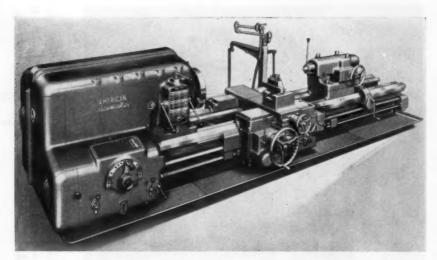
One manufacturer was scraping flat pieces measuring 18 by 24 inches...each piece requiring 5 hours to scrape by hand. An Andersor. Power Scraper cut scraping time to 50 minutes! That meant a substantial saving in production costs and another happy Anderson customer. Let us help you estimate how much this portable, easy-to-use power scraper will save for you.

Today, Write for Bulletin 8-22

(Anderson

ANDERSON BROS. MFG. CO., Rockford, III.

Encircle No. 387 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

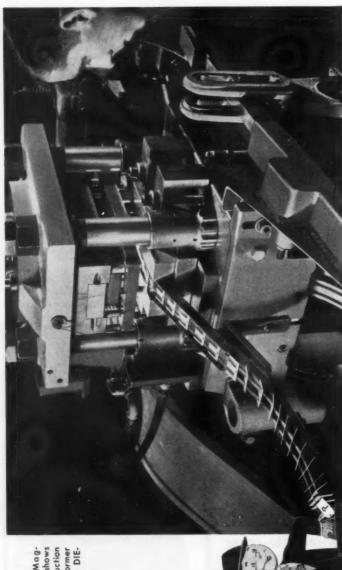


lathe work as well as general maintenance and repair requirements. It is claimed to be adequately powered, generously proportioned and convenient and easy to operate.

Offered in a variety of center distances, there is a choice of 18 or 27 spindle speeds and wide range of threads



Photo courtesy Magnetic Metals Co. shows automatic production of power transformer laminations with DIE-CARB dies.



Mr. Tooley Says:

"There are two sides to every question"

# CROMOVAN

HIGH CARBON—HIGH CHROME STEEL

- Tougher edge
- Better edge wear
- Safe to heat treat
- Easier to machine

# DIECARB

THE HIGH PRODUCTION CARBIDE

- Made expressly for blanking and lamination dies.
- High resistance to shock and abrasion.
- Low regrinding cost.
- Greater production per die life.

I he question of which die material to use for blanking and laminating operations involves a choice of either steel or carbide. Consideration must be given to the factors which determine die life, such as abrasiveness of the material to be worked, burr limit, distortion of product or elimination of subsequent machining operations.

In the selection and purchasing of die materials, Firth Sterling offers you unique advantages because it manufactures both steel and carbide. From one dependable source of supply you are assured of completely unbiased recommendations and the right steel or carbide or both for every die making need.

Typically, Firth Sterling DIECARB and Firth Sterling CROMOVAN (die steel) are widely used for blanking and laminating operations, depending upon job requirements. Write today for literature and unbiased recommendations for your specific needs.

# SHOW ENGINEERING VISIT OUR BOOTH 837 PRODUCTION

# Firth Sterling

GENERAL OFFICES: 3113 FORBES ST., PITTSBURGH 30, PA.

MILLS: MCKEESPORT, TRAFFORD, DETROIT, HOUSTON
OFFICES AND WAREHOUSES+: BIRMINGHAM CHICAGO+ CLEVELAND DAYTON DETROIT+ HARTFORD+
HOUSTON LOS ANGELES+ NEW YORK PHILADELPHIA PITTSBURGH WASHINGTON WESTFIELD, M.J.

PRODUCTS OF FIRTH STERLING METALLURGY
High Speed Steels
Tool & Die Steels
Stainless Specialities
High Temperature Alloys
High Temperature Cormets

CALL YOUR FIRTH STERLING DISTRICT OFFICE OR DISTRIBUTOR. ASK MR. TOOLEY

Encircle No. 389 on Card, Opposite Page 65

and feeds. The American Tool Works Co., Dept. BB, Pearl St. at Eggleston Ave., Cincinnati 2, Ohio.

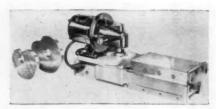
Use ACTION Card, opposite page 64, Encircle No. 49

# Cycling power feed unit controlled by interchangeable cams

Cam-controlled automatic feed cycles for precision metalworking operations are provided by a new cycling power feed unit, consisting of a slide assembly, feed mechanism, cam drive motor and housing. It is practical for drilling, tapping, boring, reaming, sawing, milling, broaching and other work on parts of relatively small size.

Variation of feed cycles is possible by changing cams, which can be done in two or three minutes. The unit measures 17" long, 6" wide and 8%" high. It can be mounted in a horizontal or vertical plane, or at any angle.

The slide assembly has a working surface of 4"x6" and provides a maximum stroke of 2". A gearmotor rotates



the cam which regulates the feed cycle of the slide, delivering a torque of 52 in.-lb. Standard cycle times of 4, 6, 8, 10, 12 and 16 seconds per revolution are available. Russell T. Gilman, Inc., Dept. B, 1243 Milton Ave., Janesville, Wis.

Use ACTION Card, opposite page 64. Encircle No. 50

### Tool holder has three parts

The NP Nu-Tool tool holder for use with NP Throway carbide inserts consists of only three parts—a one-piece alloy steel holder heat treated to 40-45 Rockwell C, a top clamp that indexes against a solid stop, and a top clamp





CHICAGO TOOL AND ENGINEERING CO., 8384 South Chicago Avenue, Chicago 17, Illinois

# Commander

- Wider Range . . . 1 Tapper Handles No. 0 to 3/4" Taps
- Automatic Tap Protection
   Furnished to fit ANY Drill Press

Commander—"The Tapper That Thinks For Its Operator," has the adjustable full range torque control that instantly stops any tap when it becomes dull, loaded, strikes a hard spot or bottoms in blind hole tapping. Assures maximum tap protection, higher production, even with inexperienced operators.

Your nearby Commander Distributor can give you a demonstration in your own plant. See us at Booth No. 502 Metalworking Machinery & Equipment Exposition, Chicago Coliseum, Sept. 6-17.

COMMANDER MFG. CO.

4227 W. KINZIE STREET CHICAGO 24, ILL.
Product of Commander . . . Builder of Production Tools

Any operator does precision tapping with a Commander TAPPER

Product of Commander . . . Builder of the Multi-Drill

Encircle No. 392 on Card, Opposite Page 65



Smaller turning radius gives much higher RPM rate than ordinary live centers.

Spring loaded spindle gives automatic tail stock adjustment.

CONVENTIONAL
LONGER LIFE

JAM PROOF

Write today for complete information

CONVENTIONAL LIVE CENTER CONCENTRIC LESS OVERHANG MEANS MORE RIGIDITY, MORE WORKING RANGE

Pat No. 2,520,473

FASTER SPEEDS

AUTOMATIC THRUST ADJUSTMENT

CONCENTRIC TOOL CORP 2486 Huntington Drive, San Marino, Calif

Encircle No. 393 on Card, Opposite Page 65



screw. The solid, hardened and precision ground tip-seating surface provides proper support and seating for the insert. This surface eliminates the need for shims under the insert. Indexing stops for the insert and clamp are solid projections of the alloy steel holder.

Standard sizes range from ¾" square to 1" x 1¼" in triangular styles TA, TB, and TF. Special sizes from ½" square to 1¼" square are also available in the styles noted above. Newcomer Products, Inc., Dept. B, 512 Franklin St., Pittsburgh 21, Pa.

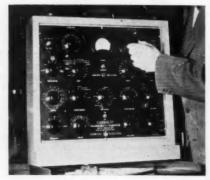
Use ACTION Card, opposite page 64, Encircle No. 51

## Computer solves machining problems in less than two minutes

A new electronic machinability computer revealed by Carboloy Department of General Electric Co., Detroit, recently, promises to solve machining problems which normally take several hours to compute, in less than two minutes with consistent and reasonable accuracy.

The tool will enable a methods and service man to determine quickly whether or not he is using a correct set of conditions for machining a current job; help him arrive at a proper set of conditions for setting up a new machining operation, or indicate to him the relative advantages of changing some of the present job conditions to obtain greater production.

The 32 pound, self-powered analog unit measures 21 x 7 x 20 inches, and will consider 14 operational variables



in machining, such as grade of carbide, speed, feed, depth of cut, tool life, alloy, material hardness etc.

It can be fed information on any of 13 variables and come up with the 14th, or the answer. It also will consider five variables which affect the motor horse-power required to do a machining job, coming up with the answer after being fed with information on four of the variables.

Answers provided by the computer are based on the use of those feeds, depths of cut, proper grades of carbide and tool geometry which will result in a normal wear type cutting edge failure.

Use ACTION Card, opposite page 64. Encircle No. 52

## Hacksaw frames now chromium plated

The Star No. 15 hacksaw frames, which were announced recently by Clemson Bros., Inc., Dept. B, Middletown, N. Y., are now being finished with a rust proof chromium plate instead of a synthetic lacquer. This new



# WILLEY'S TUNGSTEN GARBIDE TOOLS

Standard thrufeed and infeed work support blades available from stock. Prices on special blades quoted on receipt of prints.



Work Support Blades for CENTERLESS GRINDERS



SPECIAL TOOLS - Prompt quotes on receipt of prints

## WILLEY'S CARBIDE TOOL CO.

SOLE MAKERS OF WILLEY'S MI

1342 W. Vernor Highway

Detroit 1. Michigan

Encircle No. 394 on Card, Opposite Page 65

## ROYAL INTERNAL COLLETS



Basic Internal Collet with 3/8" Expander \$30.00

- . SELF-RELEASING . EXTREMELY ACCURATE
- . INCREASE PRODUCTION UP TO 300%



Basic Body with 1-1/2" Expander (prices on application)

Eliminates the need for arbors, lathe dogs, arbor presses, and other "make-shifts." Royal Internal Collets translate minutes into money . . . eliminate stops and starts when used with lever type draw bars. Precision manufactured, for use on lathes, grinders and collet fixtures. Fits all standard 5C lever and handwheel draw bars.

See your local distributor or write direct. Literature on request.

Hardened and Ground Pads, 7/16" to 1" x 1/32".

Also Semi-Hard RC20 Pads, machinable to diameters from 7/16" to 1" x 1/16". \$2.75

ROYAL TASK MASTER SET Internal Collet and 19 hardened pads and 10 semi-hardened pads in convenient toolmaker's case. \$137.50 (complete with case) \$ 15.00 (case only)



ROYAL

ROYAL PRODUCTS, 84 Union Street, Mineola, L. I., N. Y., Ploneer 6-4245

finish resists stains, can be easily cleaned.

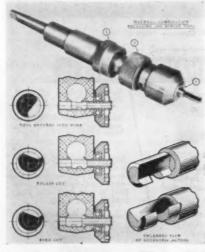
Frames have a new, simpler mechanism for applying correct blade tension, changing blades, and adapting frames to fit 10 or 12 inch blades. These operations are accomplished by simply sliding out a cam-action lever on the bottom of the handle.

Use ACTION Card, opposite page 64, Encircle No. 53

## Combination recessing and boring tool

Recessing and boring cuts are made simultaneously with this new metalworking tool developed by the Maxwell Co., Dept. B, 250 Broadway St., Bedford, Ohio.

The cutter is designed so that after it reaches required recess diameter, and tool starts boring operation, chamfer or



form ground into front end of cutter acts as a boring tool. Simultaneously, a second cutting edge is provided so that bore travel is held to a minimum. On completion of bore cut, tool is retracted and finish or shaving cut is performed on return stroke.

Use ACTION Card, opposite page 64. Encircle No. 54



The Ajustrite sit-stand-lean stool requires no tools of any kind to make adjustments from a stool low enough to sit on, to a high leaning support. The Ajusto Equipment Co., Dept. B, 2144 Madison Ave., Toledo 2, Ohio.

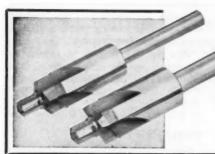
Use ACTION Card, opposite page 64. Encircle No. 55

#### Increased die life claimed for 37-ton press

An addition to the Press-Rite line has been announced by Sales Service Machine Tool Co., Dept. MBT, 2363 University Ave., St. Paul 14, Minn.

This new No. 3-½ 37 ton press claims increased die life resulting from the high-strength alloy frame and the heavy reinforcing ribs. These ribs extend from the main bearings, around the gap and down beyond the bolster. They are further supplemented by webbed ribs on bed, base or ram bearings and above the main crankshaft bearings. This construction is said to eliminate die-wearing deflection even under maximum capacities.

Other features include the single-



NOW...
PORTING TOOLS

Available from Stock

AND-10050 -

Send for valuable data sheet A complete line of carbide tipped combination ream, counterbore and facing tools to form AND-10050 standards. Tube sizes 2 through 24 in turret lathe and drill press types. Special tools made to order.

## WETMORE TOOL & ENGINEERING CO.

Engineers Designers Manufacturers
5318 E. Washington Blvd., Los Angeles 22, Calif. AN 9-7266

Encircle No. 396 on Card, Opposite Page 65



## PRESS BRAKE DIES

for greater die life at no extra cost on any make of press brake

Whether it is a simple die for angle bending or the more complex dies for any of the combined bending and forming operations, CHICAGO induction-hardened dies offer bonus performance at no extra cost. Field reports on these dies show better than ten times the useful life of the conventional dies used in press brakes. Get the full particulars on CHICAGO dies for your next press brake job.

indicate hardened surfaces

4915

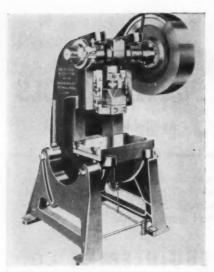
Steel Bending Brakes for over 50 Years



7440 S. Loomis Boulevard, Chicago 36, Illinois



Heavy lines



stroke safety clutch, cam actuated brake, full vee ram ways, and extra-heavy ram slides. With the four point mechanical clutch the standard speed is 120 strokes per minute.

Use ACTION Card, opposite page 64. Encircle No. 56

## Measurement of high machinery speeds

The Celerimeter, developed by the Lake Erie Eng. Corp., Dept. B, 887 Woodward Ave., Buffalo 17, N.Y., was



designed for measuring the straightline speed of moving sections of fixed machinery and equipment.

This portable unit is capable of measuring speeds ranging from 5 in. to 30,000 in. per minute. Weight is 26½ lb. Unit operates on 110-volts-60 cycles.

Use ACTION Card, opposite page 64. Encircle No. 57

#### Master plain ring gages

Size Control Co., Div., of American Gage and Machine Co., Dept. BB, 25 W. Washington Blvd., Chicago 12, Ill., has announced master ring gages made within  $\pm$  .0002" of any specified size.

Used for gaging and setting indicating



bore gages and inside micrometers, these gages are made with exact size shown on master to four (.0000") decimal places, accurate to .0001" in roundness, straightness, and taper, non-accumulative. They are available from .1870" to 3.000" with larger sizes available in AGD tolerances.

Use ACTION Card, opposite page 64, Encircle No. 58

## Improved universal miller

The design of the Deckel Model FP2 universal milling and boring machine is based on the FP1 and makes it possible to do accurate drilling, boring,

#### ELECTRO-MECHANO INTRODUCES

## NEW PLANETARY MICRO - FEED

**Precision Sensitive Drill Press** 

Planetary Micro-Feed—a method of feeding through 4:1 ratio—allows for a very fine quill feed for drills down to .004". Standard feed is used for drills No. 60 to 5/32". **Either feed is instantly available.** Using the Electro-Mechano Micro-Feed, the average operator can drill the smallest holes without excessive drill breakage.

Correct drill speed is assured with instant variable speed control 1,000 to 10,000 or 2,500 to 15,000 rpm, Features direct drive electric motor spindle.

Priced from \$165.00 Complete

Write for FREE Literature

The ELECTRO-MECHANO CO. 263 E. Erie St., Milwaukee 2, Wis.



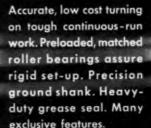
Encircle No. 398 on Card, Opposite Page 65

## ...precision performance-ALWAYS!

## Falls ROTO CENTER



for lathe and grinder tail stocks



FREE BULLETIN 105

"What you should know about LIVE CENTERS"

FALLS PRODUCTS, INC., 122 Genoa Street, GENOA, ILL., U.S.A.



slotting, and vertical, horizontal, angular, or spiral milling. Improvements over the earlier model include increased size of workpiece capacity and increased number of speeds and feeds.

The major features: compact arrangement, built-in motor; two-directional power feed to spindle head; additional axial adjustment of spindle in head; 18 speeds from 40 to 2000 rpm; 18 feed rates from .315 to 15.8 in. per min.; directional single-lever control of table feed; rapid power traverse in all directions; swivel-type vertical boring and milling head with three feed rates; horizontal and vertical cutter spindles with No. 40 I.S.A. taper; controls conveniently grouped within easy reach of operator; guide ways and screw spindles protected by bellows.

Machine is equipped with 3 hp motor and overarm for extending horizontal spindle. Special attachments include vertical spindle head, high-speed vertical spindle head, milling and boring head, slotting attachment, fixed and swiveling angular tables, circular table, jig boring table, index head, and spiral milling attachment. Cosa Corp., Dept. BB, Chrysler Building, New York City.

Use ACTION Card, opposite page 64. Encircle No. 59

## Machine vise has movable rear jaw

The specially constructed rear jaw of the Alina machine vise is movable and slides under the fixed front jaw. This arrangement allows for accurate clamping since neither jaw can lift or tilt up. It also provides a wide area of support for the clamped part.

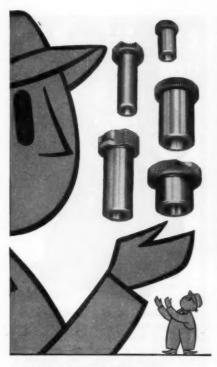
Sliding surfaces are fine ground and are accurate to .0004". The steel screw is constructed so that it is subject only to tension and the rugged construction of the vise allows for heavy duty applications. Alina Corporation, Dept. B, 401 Broadway, New York 13, N.Y.

## Band saw blade has positive rake teeth

A band saw blade with positive rake teeth, the Lenox hook-tooth blade, has been developed by the American Saw & Mfg. Co., Dept. B, Springfield, Mass. Blade will cut nonferrous metals, wood, and plastics.

Positive rake teeth have a forward





# UNIVERSAL DRILL BUSHINGS

Industry's standard of quality and service

UNIVERSAL 189-B ENGINEERING COMPANY

FRANKENMUTH 10, MICHIGAN

Encircle No. 400 on Card, Opposite Page 65 August, 1955



Only with Alpha can you barber, shear, fit and finish both die members without removing dies from the press, thus permitting faster, more economical production.



(Left) 2 post press 50, 75, 100 tons. (Below) 4 post press 100, 150, 200 tons.



Send for this folder today!



PRESS & MACHINE, INC. 9281 Freeland Ave., Detroit, 28, Mich.

Encircle No. 401 on Card, Opposite Page 65
28

inclination, so that they "hook" themselves into the work, to cut with greater ease at higher cutting feeds. Blade also features rounded gullets for maximum chip clearance.

Teeth are flame-hardened to 63-65 Rockwell C. Flexible blade back is 25-30 Rockwell C. Blades are available in ½" to 1" widths, from 2 to 6 teeth per inch. Packaging includes 100', 250' and 500' coils, also blades cut to length and welded.

Use ACTION Card, opposite page 64. Encircle No. 61

#### End measuring rods

End measuring rods made from selected steel have been announced by the Swedish Gage Co. of America, Dept. B,



10641 Haggerty St., Dearborn, Mich.
Rods and micrometer heads can be purchased individually or in sets.

Use ACTION Card, opposite page 64. English No. 62

#### Inside taper marking

The Schmidt Model 175-S hydraulic marking machine rolls the part number and consecutively serial numbers the inside concave taper of diesel engine pistons in one operation.

A combination barrel style numbering head and type holder is used. The



upright frame of the angular roller bearing tandem cradle supports a locating ring for the serial numbering operation with a rack and pinion operated numbering head. An auxiliary steel ring in the cradle acts as an anvil and thrust bearings hold the piston in position during marking. Geo. T. Schmidt, Inc., Dept. B, 1802 Belle Plaine Ave., Chicago 13, Ill.

Use ACTION Card, opposite page 64. Encircle No. 63

## Shank type center has interchangeable points

The Ready Tool Co., Dept. BTM, 554 Iranistan Ave., Bridgeport 5, Conn., has introduced a group of new interchangeable points for the Red-E shank-type, anti-friction ball-bearing centers. They are claimed to have perfectly ground threads to match those of the head. Four types are available: (1) standard male; (2) standard female; (3) standard round blank, soft tool steel; (4) bull nose point. Point sizes available range from ½" to 3" dia. The male, female

## SAVE HOURS CUT HEAT TREATING COSTS



Quick Acting JOHNSON No. 142 Hi-Speed Furnace

Save time, save gas . . . heat treat carbon and high speed steels, dies and tools with JOHNSON 142. Powerful burners provide fast uniform heat with time saving speed. Gets the job done while other furnaces are still warming up. Temperatures easily regulated with accuracy. Counterbalanced door opens upwards. Firebox 7" x 13" x 161/2" lined with high temperature refractory. Complete with Carbofrax Hearth. G.E. Motor and Johnson Blower.

For temperature range

1300° to 2350°F .....\$325.00

F.O.B. Factory

Models available in smaller firebox sizes. Write for Free Catalog.

JOHNSON GAS APPLIANCE CO. 570 E Ave. N.W., Cedar Rapids, Iowa

FURNACES FOR INDUSTR

Encircle No. 402 on Card, Opposite Page 65 August, 1955

## KAUFMAN TAPPING MACHINES



#### **Built For Specific Production Johs**

- · Single or Multiple Operations
- · Precision Depth Control
- Non-reversing Motor Drives Pressure Lubricated Lead Screws
- Fast, Accurate, Rugged Index
  Other Head Units Available

#### And Many Other Worthwhile Features

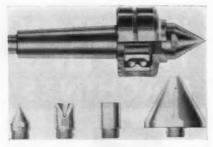
Send prints and samples of your work for further information and recommendations on how Kaufman Tapping Machines can reduce your production costs.

Catalogs Number 754 and 1153 Mailed on Request

## KAUFMAN MFG. CO.

546 SOUTH 29TH STREET MANITOWOC, WISCONSIN

Encircle No. 403 on Card, Opposite Page 65



and bull nose points are made of hardened alloy steel while the standard round blanks are of soft tool steel. The standard male point is furnished with the shank center or the type point desired if specified.

Centers are made in all tapers and shanks, designed with double row, angular contact ball bearings and feature a short overhang so that work is close to the tailstock. Accuracy is held to less than .0001" total indicator reading.

Use ACTION Card, opposite page 64. Encircle No. 64

#### Vertical lathe tools

The new Wesco vertical lathe tools are manufactured in two models for production work where speed and precision are required. The vertical cutoff tool features an automatic-return type slide which holds a standard cutoff blade. The vertical form tool also incorporates an automatic return type



of slide which holds a standard ½" tool bit. Adjustable stops are provided.

Both units mount on headstock of lathe for maximum rigidity and provide a third position for turret lathes, which often eliminates the usual second operation.

Tools are designed for use on many lathes including: Elgin, Hardinge, Delta, Atlas, Logan (10", 11", 12"), Warner Swasey (No. 1 and No. 2), Clausing, Craftsman, South Bend, and Sheldon. Wesco Machine Corp., Lathe Tool Div., Dept. B, 7536 San Fernando Rd., Sun Valley, Calif.

Use ACTION Card, opposite page 64. Encirele No. 65

#### Magnetic base dial indicator holder

A magnetic base dial indicator holder, Tiny Titan No. 130, with a magnetic pull of 65 lb. has been announced by the Enco Mfg. Co., Dept. B, 4520-26 W. Fullerton Ave., Chicago 39, Ill.

The holder is said to instantly mount



on a flat or round surface as small as 34" dia. It is equipped with a ball and swivel of brass, with a stem of non-magnetic material which isolates magnet from indicator, a swivel adaptor which allows full 360° adjustment in all directions and an adaptor for attaching 5/32" stud type indicators.

Use ACTION Card, opposite page 64. Encircle No. 66

# SET UP COMPOUND ANGLES INSTANTLY!

Now save valuable time on intricate, angular set-ups with the fully universal MASTER MULTI-SWIVEL VISE. Three swivels instantly set any compound angle. Used worldwide. Interchangeable platens optional.

Write for circular.

## DONOVAN MFG. CO.

80 Batterymarch St. Boston 10, Mass.



Encircle No. 404 on Card, Opposite Page 65

## Boring machine has automatic controls

The Unimatic boring machine has automatic and manual controls, with timers for repetition of predetermined cycles for cutting, dwell, and reverse motion of the table and cross slide. It will handle work up to nine inches in diameter, and perform boring operations to a depth of six inches.

The headstock has a built-in sine bar to implement accurate boring and turning of tapers. An air-operated spindle brake, and complete, motorized, coolant facilities are also features.

Full round table-ways and guide bushings, and a "floating" support are claimed to assure correct tool position regardless of contraction and expansion of the machine parts due to changes in weather and temperature.

The motor is a one-half horse power, 1750 rpm, totally enclosed, sleeve bearing type, with spindle speeds available from 775 to 4000 rpm. Atlantic



Instrument Corp., Dept. MTB, Norwood, Mass.

Use ACTION Card, opposite page 64. Encircle No. 87



## Air-Hydraulic Table Feed Developed for Bench Millers

For controlled, high speed production of small parts, an air-operated hydraulically controlled table feed has been developed for the four models of bench millers manufactured by the U.S. Burke Machine Tool Div., Dept. BB, Cincinnati 27, Ohio. Millers can be equipped with either 16" or 20" long tables and on either table an 8" stroke air motor can be used, together with an 8" stroke hydro-check valve and suitable limit switches, transformers and solenoid valves.

The table is adaptable to a wide range of applications including: milling, sawing, facing, slotting. Distance and



speed of the rapid traverse approach, the cutting feed and length, and rapid automatic return are easily varied according to job requirements.

Use ACTION Card, opposite page 64, Encircle No. 27

3-Ton

## YALE AND TOWNE CHAIN HOIST WITH BALL BEARING TROLLEY

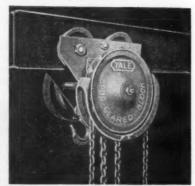
10-foot lift Weight in boxes 450 lbs. Regular list price \$515.00

#### NEW \$150.00

Chain Hoist similar to above, manufactured by Ford, a division of American Chain and Cable.

\$130.00

Prices F.O.B. Fort Worth



VESTERN INDUSTRIAL PURCHASING CO.

2468 E. Lancaster

FORT WORTH, TEXAS

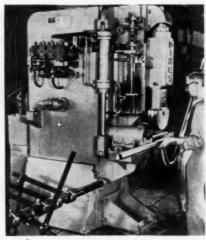
LO-8310

Encircle No. 406 on Card, Opposite Page 65

## Tube and pipe bending press improved

Pines Engineering Co., Inc., Dept. BB, Aurora, Ill., has announced an improved pipe and tube bending press that makes possible increased production speeds up to 1400 bends per hour without excessive flattening, wrinkling, or distortion. Unit is fully hydraulic, self-contained, with adequate power and capacity for repeat bending of ½" through 2" od steel tubing size with a maximum wall thickness of .083". Clearance is provided to bend a 2" tube with a 5" centerline radius to 180°.

Six new design features are incorporated in the press; one-piece C frame casting; cast steel ram and built-in ram cylinder; accurate angle-of-bend control; improved wing die operation; manifold-type valves; adjustable return



stroke.

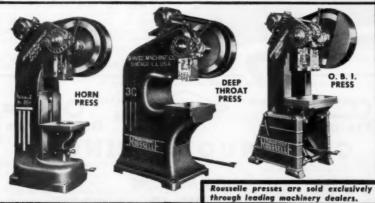
Use ACTION Card, opposite page 64. Encircle No. 26

# Expect More with a ROUSSELL F

More strength where it counts...
More accuracy where it's needed...
More simplicity where it helps...

...to turn out first rate work FAST with steady, dependable regularity

You'll like the economical run-of-job cost, the simpler maintenance, the easier set up and operation and the wider variety of work each one can handle. And YOU'LL LIKE THE PRICE when you compare Rousselle specifications and quality . . . Ask for condensed catalog.



SERVICE MACHINE CO.

Mfrs. of Rousselle Presses . 2310 West 78th Street - Chicago 20, Ill. SOLVE CUT-OFF PROBLEMS

Variable Speed Drive—Full Hydraulic Operation

MODELS W & F-9" x 18" and 14" x 18" capacity, respectively. Rigid welded steel base and welded onepiece cutting head. Easier chip removal and blade change. Larger capacity coolant and chip tray. Automatic bar feed available. Send for FREE CATALOG today!

W. F. WELLS & SONS

THREE RIVERS, MICHIGAN Encircle No. 408 on Card, Opposite Page 65



## for Every Need!

Supplied in one Superior Accuracy 5 MILLIONTHS ± ACCURACY

34 BLOCK SET (shown) \$132.50

82 BLOCK SET .... \$303.00 IN CASE

These sets will supply the needs of any discriminating shop that must work to gageblock precision. IMMEDIATE DELIVERY

9 Block Set

For Individual Mechanic

\$24.75 OPTICAL PARALLEL

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200-MT LAFAYETTE STREET . NEW YORK 12, N. Y. Encircle No. 409 on Card, Opposite Page 65



Plunket Quick Action Vise

for DRILL PRESS or MILLING MACHINE Designed for production work, using an eccentric motion to apply pressure to jaws. Eccentric motion moves jaws 5/16". Size No. 7 Net Price

6" Jaws, 11/2" deep, opens 4" ....\$83.16 Pressure between jaws, with handle furnished, 2200 lbs. Net weight 36 lbs. Our complete line includes Vises for Drill Presses, Milling Machines, Shapers, Grinders

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3230-32 Archer Ave. Chicago 8, III. J. E. Plunket Machine Co.

Encircle No. 410 on Card, Opposite Page 65

CLOSED TRADE AUTOM MARK

CLOSED

ONTINUOUS HING

All hinges shown can be furnished with special holes, cutouts and bends blue-print in metals to suit the job.

THREE-FOURTHS OFFSET

AUTO MOULDING & MFG. CO. 1110 E. 87TH ST. CHICAGO 19, ILL.

SPECIFICATIONS Open width 7/8" to 6" Gage Material .040 to .125 Pin Diameter .101 to % Lengths to 120"

Encircle No. 411 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

## Automatic drilling, tapping machine

The Beco Model No. 410 automatic drilling or tapping machine locates and securely holds rivets or other headed parts for axial tapping, or drilling to very thin walls, without out-of-round distortion and central with the axis of the parts.

Automatically self-reversing tapping attachments are used for tapping. Changeover from drilling to tapping is accomplished in about ten minutes. Coolant tanks containing different coolants are exchanged in less than two minutes.

Production in mild steel with No. 30 (.1285) drill 9/32" deep is 40 per minute, No. 17 (.173) drill 5/32" deep is 45 per minute and No. 8-32 tap 3/16 deep

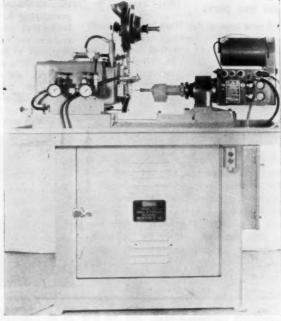
is 80 per minute.

The machine operates by electrically controlled compressed air on at least 50 psi air line pressure at approximately 500 strokes per cubic feet of free air. Solenoid 3-way valves controlled by relays and sensitive switches regulate the cycling. If a part is not properly positioned or the hopper runs out of parts, the machine shuts itself off. Batchelder Eng. Co., Inc., Dept. B, 125 Main St., Springfield, Vt.

Use ACTION Card, opposite page 64. Encircle No. 24

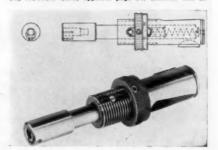
Tension and compression tap drivers

Seibert and Sons, Inc., Chenoa, Ill., has announced the development of two new, improved adjustable tension and compression tap drivers for use in spindles taking adjustable adapter



shank tools. Both drivers are selfadjusting by spring-action, to variation of feed between spindle and tap. The tension-type is designed for use when the spindle feed is less than the feed of the tap. The compression-type is used when the spindle feed is greater than the feed of the tap.

Use ACTION Card, opposite page 64. Encircle No. 25



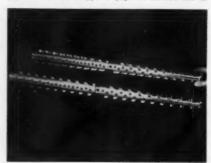
#### Inserted tooth carbide surface broach permits heavy cuts on cast iron parts

A new type of Red Ring inserted-tooth carbide surface broach designed to avoid chatter and cut tool costs when taking heavy cuts on semi-circular cast iron surfaces is now available from National Broach & Machine Company, Dept. MTB, 5600 St. Jean Ave., Detroit 13, Mich.

These broaches are a progressive type

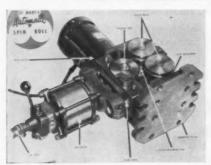
Broach bar sections from the new Red Ring progressive-type inserted tooth carbide surface broaches that finish semicircular surfaces on cast iron parts. The upper section has the inserted carbide tools in position. The lower section has the tools removed to show the tool backup integral lugs that support each cutting tool. that feature a broach bar having machined integral lugs which back up each of the inserted carbide tipped tools, permitting heavy cuts to be taken by individual tools. This design can also reduce the effective length of broach required to finish a semi-circular cast iron surface or a portion of a circular surface. Length of broach required depends on the width of the surface, amount of stock to be removed and the stroke of the broaching machine.

Use ACTION Card, opposite page 64. Eneirele No. 69



## Automatic centering tool uses no collets, chucks

The St. Mary's Spin Roll, an all purpose universal centering tool which reportedly achieves concentricity for metal components from practical zero up to 1.250 finished diameters without the use of collets or chucks has been announced



by the Pivot Punch and Die Corp., Dept. B, 373 Old Niagara Falls Blvd., North Tonawanda, N.Y.

Fully automatic, the unit is self-centering, self-adjusting to uniform diameters, lengths, speeds and feeds because the surface speed is constant.

The work piece rotates on its own diameter between the spin rolls, a series of synchronized interlocking rollers, while secondary diameters are generated. Every inside or outside diameter is concentric to all other diameters in the same plane.

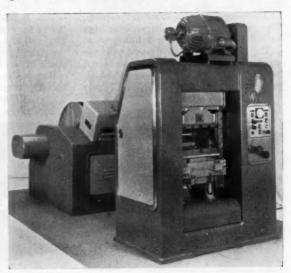
Unit is claimed to be adaptable for all rotary machining and grinding operations. Over-all dimensions are 8\%"x9\%" x17" including the 1/6 hp, 110 volt, single phase capacitor motor. Mounting dimensions for vertical work are 8\%" x 4\%".

Use ACTION Card, opposite page 64. Encircle No. 70

## Press Steps Up Speed and Production

The Wean Flying Press is a new concept of press design with great operating speed as its objective; it is claimed as having a possibility of revolutionizing much of the stamping industry from a speed and productivity standpoint.

The press eliminates the necessity for starting and stopping the feed of the coiled steel, which moves at a continuous speed through the press at all times. The upper and lower dies move forward and synchronize with this speed during the time in which the



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CAM



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CHARLES EISLER JR., PRESIDENT EISLER ENGINEERING CO., INC., 762 So. 13th Street, Newark, N. J. stamping is performed, thereby increasing the number of parts that can be made each minute and giving greater accuracy to the length which is fed into the press, the manufacturer reports. The production here will reach as high as 600 - 900 strokes per minute.

The idea of dies which move with the strip as the work is being done is not new in itself, but the method by which it is accomplished in the Flying Press is claimed to be new, and embodies the idea in a successful and vibrationless machine for the first time.

The press has neither clutch nor brake. It has no flywheel as such, but stores its energy in the motion of the dies and die holders, thereby applying the latent stored energy right at the place of work.

Because the strip never stops as the speed gets greater, the velocity of the



completed part becomes greater and is ejected from the press with greater and greater ease as the speed increases. All the controls necessary for operation have been brought to a panel at one side of the machine. Wean Equipment Corp., Dept. BB, 22800 Lakeland, Cleveland. Ohio.

Use ACTION Card, opposite page 64, Encircle No. 39

#### **Drilling machines announced**

New 16" sliding head bench, floor and multiple spindle drilling machines have been announced by Cincinnati Lathe and Tool Co., Dept. BB, Cincinnatti 9, Ohio.

For easier drilling and higher production, the drills may be ordered with





Telephone: CAnal 6:4992

Encircle No. 414 on Card, Opposite Page 65

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Saves TIME and LABOR

Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height from 31" to 46½", leaving operator's hands free. Table swivels and locks in any position.

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THE MIDWEST TOOL & ENG. CO.

geared power feed. A simple selector is used to obtain any of four rates of feed which are engaged through a positive-jaw clutch. The entire power feed mechanism is housed in the head. A new direct-reading depth dial with positive stop is provided. When the drill is equipped with power feed, the dial may be set to disengage feed automatically.

The spindle is full-floating, being mounted in precision, sealed, lifetime lubricated ball bearings. A simple V-belt drive transmits motor power directly to the spindle. A unique tilting motor bracket is provided to make spindle speed changes easy. No wrenches are required and both hands are free to shift the V-belt to the proper groove. A full, contour-fitting belt guard is standard equipment.

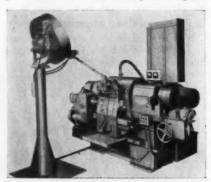
The drills are rated at 1" in cast iron with a 1 hp, 1800 rpm motor. A No. 2

Morse taper spindle is standard. A No. 3 Morse taper spindle is optional if specified.

Use ACTION Card, opposite page 64. Encircle No. 40

Automatic disc grinder for processing piston pins

An automatic disc grinder with hopper feed has been developed for pro-





# Engineered Live Centers designed Live Center is one of the fundamentals of setting up a job and requires a specialist's experience. Characteristic of the design of all STURDIMATIC LIVE CENTERS is a low overhang and a slight cushioning action that compensates for expansion due to heat shock and excessive thrust loads—reducing wear to a minimum. Send us your blueprints and specifications—we will see that your job is set up with the right Live Center. Standard shanks with Morse taper carried in stock.



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Above is shown a 6M Fen Automatic Wrench operating a 28" heavy duty

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You can put the advantages of the Fen Automatic Wrenches to your work right in your own shop on machines already in operation, or specify them on your new standard or automatic machines.

THE FEN MACHINE COMPANY 28914 Lakeland Blvd. Wickliffe, Ohio

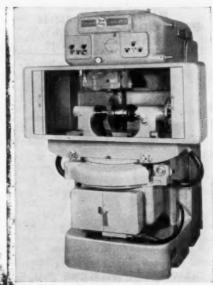
For detailed information regarding the application of the Fen Automatic Wrench to your machines, phone, wire or write.

cessing piston pins by Mattison Machine Works, Dept. B, Rockford, Ill.

Pins enter a stacking mechanism, from which they are picked up by a rotating carrier plate and clamped in hardened "V's." The carrier plate revolves between opposed grinding wheels, and .010" stock is simultaneously removed from each end of the pins in one pass. Finish ground pins are unloaded automatically through a chute into tote boxes. Production is 2100 piston pins per hour, gross.

## Gear shaver uses either of two processes

A new Red Ring rotary gear shaving machine finishes external spur and helical gears up to 18-in. dia, by either diagonal or conventional shaving processes. Called the Model GCU-18-in. the shaver is available in three different types: (1) shaves gears by the



high production diagonal process; (2) shaves gears by either the diagonal or



(Write for catalogue)

ESSEX ROTARY FILE & TOOL CORP.

Makers of Fine Tools Since 1868
295 MADISON AVE.

NEW YORK 17, N. Y.

Encircle No. 418 on Card, Opposite Page 65



Encircle No. 419 on Card, Opposite Page 65

New York 4, N.Y.

conventional process and has an automatic differential upfeed mechanism and (3) shaves gears by either conventional or diagonal processes, has an automatic differential upfeed mechanism, and permits crown shaving operations to be performed.

The machine will shave spur and helical gears from 2½" to 18" pitch diameter having 4 to 16 diametral pitch teeth. The table has a maximum stroke of 5". National Broach & Machine Co., Dept. MBT, 5600 St. Jean Ave., Detroit 13. Mich.

Use ACTION Card, opposite page 64. Encircle No. 41

## Machine automatically locates and drills holes up to $\frac{1}{2}$ " dia.

Designed to drill holes of various diameters on a variety of work up to 24" x 48" or longer, the Model 24 Hillyer drilling machine automatically locates and drills any number of holes up to ½" dia. in rapid sequence. Hole positions are automatically located within close tolerances. Machine is equipped with an adjustable speed drilling unit (275 to 4250 rpm) which automatically drills to any desired depth. The rate of drill feed can be adjusted to meet material requirements.

The operator sets the length and width dimensions in increments of .001"



304

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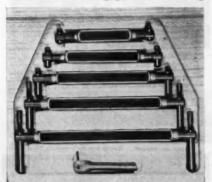


cn decimal dials and presses direction controls to set the machine in motion. The rest is automatic. If desired, the drilling operation can be controlled manually. Hillyer Instrument Co., Inc., Department 37, New York 13, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 42

## Hole check gages

A new line of gages for checking



holes has been announced by R-C Specialties, Dept. B, 1641 W. 135th St., Gardena, Calif.

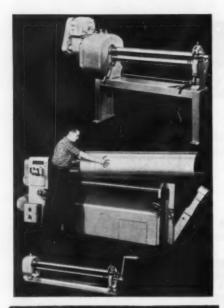
These gages are said to be an inexpensive method for checking holes for out of round, taper, bell mouth and hole tolerance.

Use ACTION Card, opposite page 64. Encircle No. 43

#### Slip roll formers feature pinch type rolls

The new line of Niagara slip roll forming machines feature pinch type rolls for production of commercially true cylinders virtually free from flat spcts.

Two of the rolls feed the material. The third, in the rear, deflects the sheet to produce the curvature. The upper feed roll, around which the sheet is formed, swings open at one end, clear of its bearing, to permit completed cylinders to be removed quickly and easily. Working with lengths up to 120" and thicknesses up to ¼" mild steel, formers



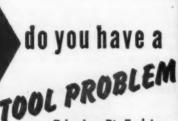
are used in diverse applications to form light and heavy pipe; stacks, drum, pail, tub and other container bodies; large tank segments; multiple beads; and numerous kinds of cylindrical, oval, rectangular and obround products.

Built in heavy, medium and light capacities with 6", 4", 3", 2", 1½" and 1" rolls to handle general requirements, standard units can be outfitted with special attachments for particular classes of work, quantity production and other purposes. Niagara Machine & Tool Works, Dept. MTB, 683 Northland Ave., Buffalo 11, N.Y.

Use ACTION Card, opposite page 64, Encircle No. 44

#### Grooving tools for internal retaining rings

Bokum Tool Co., Dept. B, 14775 Wildemere Ave., Detroit 38, Mich., has recently announced a line of standard grooving tools in a selection of types and sizes for cutting grooves for all retaining rings-standard, inverted, self-



Columbus Die-Tool has been solving tooling problems for over 45 years. Expert designers and builders of all types of tools and special machinery. Write us today

# and Machine Co.

P. O. BOX 750 . COLUMBUS, OHIO

Encircle No. 421 on Card, Opposite Page 65 306



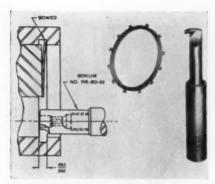
**ELIMINATE GAGE LABOR COSTS** 

. , other than hole opening, hardening and grind-ing . . . thus saving hours of gage makers' time with resulting economics. Made of sized and plated. Light in weight yet capable of holding the rings by a clamping action. Ring blanks SAE 01. Made in four sizes.

Size A	- 1	0240	Inc.	\$6.06	
Size B	- 1	.240510	ins.	\$6.73	
Size C	1	.510825		\$7.91	
Size D		.825-1.135	Inc.	\$9.50	

MECHANICAL PRODUCTS CO. 30 MANHAN ST., WATERBURY, CONN.

Encircle No. 422 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK



locking, bowed and beveled.

Larger size tools are two-piece construction, permitting use of several different cutters of the same size tool on the same heat-treated alloy steel shank. Longer bars, too, compensate for the distance of the groove from the end of the work piece. Cutters are available in both high speed steel or carbide tipped.

Cutters are either helical or helical and radial backed off—depending upon the tool—to permit resharpening of one face only and to assure long life.

Use ACTION Card, opposite page 64, Engirele No. 45

#### Nameplate stamping machine

The Noblewest automatic, power operated nameplate stamping machine, Model 390, features a power press equipped with a two station stamping head for applying either constant, variable or serial numbers on etched steel, brass or aluminum nameplates. The press is also equipped with loading and unloading magazines, an air operated work feeder and an air operated work stacker for fully automatic operation.

The progressive serial numbering is applied by an automatic numbering head which indexes consecutively with each stroke of the press. Other variable

# Any Deburring Problems?

The fastest and most economical method for deburring the edges of all kinds, shapes, and forms of steel caused from shearing, burning, or sawing. Simply plug into any light socket. Easily moved to a convenient location in shop.

#### No. 106-DB DEBURRING MACHINE

Ball Bearing Equipped throughout. Furnished with Rubber Contact Roller Platen for longer belt life. Utilizes 4" x 106" Abrasive Belts. Complete with  $\frac{1}{2}$  h.p., 60 cycle, single phase 110/220 volt, Ball Bearing Motor.

No. 64-DB Bench type also available. Jobbers Inquiries invited.

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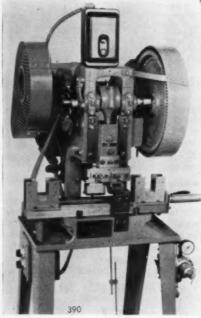
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STANDARD STEEL SPECIALTY
COMPANY

BEAVER FALLS

PENNSYLVANIA

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or random data is set up in individual type or multiple character logo dies in a holder mounted in the second station. The press may also be operated semi-automatically. Noble & Westbrook Mfg. Co., Dept. MBT, East Harftord, Conn.

Use ACTION Card, opposite page 64. Encircle No. 46

## Midget work positioner

The line of PowRarm work positioners was recently extended to the smallest



MACHINE and TOOL BLUE BOOK

type of assembly and inspection work with the introduction of the new Midget model, only 2" in height, and weighing barely ½ lb. It can support 5 pounds of work weight at a distance of 3" from the swivel center.

Work may be rotated freely in all three planes and locked in any desired position by moving the control lever. Wilton Tool Mfg. Co. Inc., Dept. BTM, 9525 Irving Park Rd., Schiller Park, Ill.
Use ACTION Card, opposite page 64. Encircle No. 75

### Drill for deep hole drilling

A precision gun type drill is available to industry for tough precision and deep hole drilling problems. It can be supplied in high speed steel, carbide insert and solid carbide tips.

A balanced two lip design reportedly gives reduced vibration, greater stability and accuracy. Willingham Drills Inc., Dept. BB, 12841 Ford Rd., Dearborn. Mich.

Use ACTION Card, opposite page 64. Encircle No. 76

# New Ease of Control With the Wells Model 1200 Metal Cutting Band Saw



The Wells model 1200 is a rugged, new horizontal band saw for heavy-duty production cutting. It incorporates all the advantages of the Wells No. 12 plus such outstanding advancements as Finger-Tip Control and greater safety with 110 Volts at the controls. And with the flip of a switch, the model 1200 becomes a completely automatic machine with continuous operation for duplicate cutting when used with the Wells-O-Bar Feed Master stock projection unit.

Call your Wells Distributor or write for Job-Engineering Service.



See us in Chicago in September, Booth 644 at the Coliseum The Pioneers of Horizontal

## METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION 707 COOLIDGE AVE. - THREE RIVERS, MICH.

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LOS ANGELES 21, CALIFORNIA Encircle No. 427 on Card, Opposite Page 65

#### MICRO-HEIGHT GAUGE

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BY FAIRFIELD GAUGE CO.



NO OTHER GAUGE COMPARES FOR FAST, ACCURATE LAYOUT AND MEASURING

Capacities to 6" when used with this Fairfield Gauge 3" Riser

The Micro-Height Gauge is a precision instrument, finished in satin chrome, which reads like a micrometer and measures from zero at base to 3" in thousandths. Use as a scriber for fast layout, or insert dial indicator for quick, accurate inspection.

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DISTRIBUTOR INQUIRY INVITED.

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complete with cerd, plug, switch ready to use

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## MICHIGAN CHROME & CHEMICAL COMPANY

8615 Grinnell Ave. . Detroit 13, Mich.



Encyrcle No. 432 on Card, Opposite Page 65 August, 1955





Built in 3 sizes for cutting keyways 1/16" to 1" width. Circular upon request.

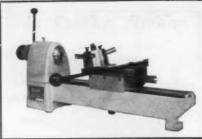
## DAVIS KEYSEATER CO.

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Encircle No. 433 on Card, Opposite Page 65



Encircle No. 434 on Card, Opposite Page 65



STARK Model No. 2 Lathe, 22" bed, Ball Bearing Headstock with Lever Collet Closer, 18,000 R.P.M. spindle speed, Pt. No. 23804, with Six-position turret, self indexing and semi-automatic, Pt. No. 23610. All castings are mechanite. Collet Capacity 5/16".

TOOL COMPANY MAYNARD, MASSACHUSETTS

Encircle No. 435 on Card, Opposite Page 65





END MILLS - think of

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312

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- Polished Flutes
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## **Rivet Spinning** on the LINLEY is fast, low

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Save time and money by putting your riveting on the LINLEY RIVETER. Send us samples of your work and we'll gladly and without obligation give you estimates on the time and cost of handling your work the LINLEY WAY.

Available in sizes and types for iron and cold relled steel rivets up to %"; larger rivets of softer materials can also be handled.

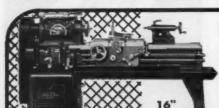


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## LINLEY BROTHERS CO.

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## GARROLL AND JAMIESON LATHES

• This 16" lathe is equipped with 12 speed geared head, motor drive, and Timken mounted spindle. It's modern in design - with liberal dimensions.

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THE CARROLL & JAMIESON MACHINE TOOL CO. .

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MACHINE and TOOL BLUE BOOK

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1	Inside Dimensions				Prices 220 volt single phase	
Model No.	Wide	High	Deep	KW	with Huppert input controller	with electronic temperature controller
869	8"	6"	9"	4	\$280.00	\$480.00
11	8"	6"	12"	4	287.00 367.00	487.00 567.00
12A*	8"	8"	18"	9	471.00	671.00

\*For 2300° F. add \$95.00 to No. 12 and \$105.00 to No. 12A. No. 12A can be furnished for 3 phase at no additional cost. For floor model add \$50.00 to above prices.

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Manufacturers of Electric Furnaces and Ovens

Encircle No. 439 on Card, Opposite Page 65

### Local fan solves hot weather slow-down problems

A local fan provides breezy comfort



to individual workers in hot weather. Airflow may be directed as desired by hand adjustment of the universal joints in the arm and a collar disc base joint which turns 180°. Universal base mounts on machine tool, bench or wall horizontally or vertically with machine or wood screws.

Fan has four 8" deep-pitched aluminum blades, with nickel plated guard. Non-oscillating. Made by The Fostoria Pressed Steel Corp., Dept. MTB, Fostoria, Ohio.

Use ACTION Card, opposite page 64, Encircle No. 28

#### Marking machine combines a pneumatic pressure ram and a pneumatic die slide

This new marking machine combines a pneumatic pressure ram for depth of mark and a pneumatic die slide for roll marking round and flat surfaces in one integral unit. The Twin-Ram head can be mounted either horizontally



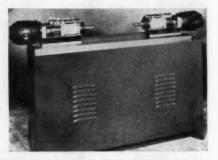
or vertically or at an angle.

The Model 354 includes an air operated work ejector for automatic unloading operating from the machine cycle. Noble & Westbrook Mfg. Co., Dept. B, 9 Westbrook St., Hartford 8, Conn.

Use ACTION Card, esposite page 64. Encircle No. 29

#### Double end machine base

The M23C-1 double end machine base was designed to simplify the building of automation-type special machines for drilling or tapping opposed holes. Parts with an accuracy of .001" has been demachined.







The exclusive design of the Walton-American swivel head holds the tool in position, giving perfect grip on round or square tool bits or boring bars. Illustration shows eight most commonly used positions.

TON COMPA ARTFORD 10, CONN.

Encircle No. 440 on Card, Opposite Page 65



#### CUT COSTS with ALLEN Punch Press

2-Ton Power Bench Type. Powerful, Dependable, Economical.

For light work-stamping, forming, riveting, etc-metal, fiber or other material.

Or other indicated.

Overall height 20%"... Base size 9" x 8%"... Die Bed 6%" x 8"

... Ram fase 1½" x 3½"... Ram Streke ¾"... pesitive ¾" ram adjustment... sturdy, single pin, non-repeat hand lever clutch.

V-beit drive ... weight 105 lbs. Requires only 1/3 H.P. metor.

The machine of a thousand uses! Adequate for many types of work now done on large presses at greater expense.

Fully Guaranteed. Order TODAY. Price \$97.50 F.O.B. Clinton, Mo. (Includes Motor bracket V-belt, motor pulley, less motor).

Dealer Inquiry Invited

ALVA F. ALLEN

DEPT. MTB, Clinton, Mo.

Encircle No. 441 on Card, Opposite Page 65

#### AUTOMATIC **PUNCH PRESS GUARD**



Springs No

Cables . \$30.00

TO \$44,00 F.O.B. BUFFALO, N. Y.

Low Maintenance

. This punch press guard meets the most exacting standards of safety engineers and safety laws. Permits operator to feed the press without hind-Write for complete information.

Immediate Delivery D & M GUARD CO.

895 Military Rd.

Buffalo 17, N.Y.

Encircle No. 442 on Card, Opposite Page 65

## EARS



· Chicago 50, Illinois 4829 West 16th Street Mfrs. of Gears and Speed Reducers

Encircle No. 443 on Card, Opposite Page 65



## for speedy drilling OF COTTER PIN HOLES IN SCREWS, BOLTS, ETC. The KENT Duplex DRILLER

Two drills move toward the center. One drill then withdraws and the other completes the hole. Parts can be drilled and countersunk at the same operation. Semi-automatic or full automatic feed. Write for illustrated descriptive literature.

Cuyahoga Falls, O. The KENT MACHINE CO.

Drillers - Threaders - Slotters - Countersinkers - Bar Pointers

Encircle No. 444 on Card, Opposite Page 65

The cast semi-steel top is 12" wide, 60" long and 4" thick and has a precision ground top to assure surface accuracy. A one-inch keyway is provided the full length of the top for fast

alignment of fixtures and machine components. Hause Engineering, Dept. B, 809 S. Pleasant St., Montpelier, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 32

## Tray-Top Engine Lathes Have 12 Spindle Speeds

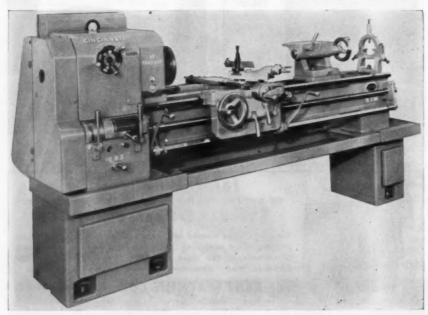
New, all-geared head, Model LE traytop engine lathes in 10", 12½", 15" and 18" sizes have been announced by Cincinnati Lathe and Tool Co., Dept. BB, Cincinnati 9, Ohio.

Lathes have 12 spindle speeds in geometric progression, with a 3-lever, color-match, direct-reading shift mechanism. The spindle, with long taper key drive nose, is mounted in three precision anti-friction bearings. All headstock bearings are pressure lubricated. Forty-eight thread and feed changes are made available through a totally enclosed, automatically lubricated quick change gear box.

The apron is a one-piece, double-walled casting with automatic lubrication. Longitudinal and cross feeds are engaged with drop levers operating positive jaw clutches, and a spindle start-stop control lever is supplied at the apron and quick change box.

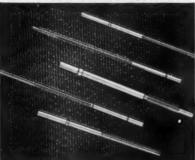
The lathes are offered with a 1, 1½, 2 or 3 hp motor mounted on the rear of the headstock leg for easy maintenance. Tray-tops on headstock and tailstock provide safe parking space for mikes, tools, drawings, gages, and other necessaries.

Use ACTION Card, epposite page 64. Encircle No. 33



### 20 TO 200 D.P.

SEND YOUR PRINTS FOR QUOTATION



SPURS • HELICALS • WORM AND WORM GEARS
STRAIGHT BEVELS • LEAD SCREWS • RATCHETS
CLUSTER GEARS • RACKS • INTERNALS • ODD SHAPES

Beaver Gear Works Inc.

1033 PARMELE ST. ROCKFORD, ILLINOIS

Encircle No. 445 on Card, Opposite Page 65

PORTABLE SUMP CLEANER

The Carnes line of portable machine tool sump cleaners is available in five models with capacities from 55 to 200 gallons.

COOLANT EQUIPMENT CORPORATION

ERONA WISCONSIN

Encircle No. 448 on Card, Opposite Page 65 August, 1955

# "HERCULES"® HOLDERS and TYPE

For putting Numbers on STEEL "Flat or Curved"



Write For Latest Literature and Prices—Today

ACROMARK Ompany

15 MORRELL ST. ELIZABETH 4, N.J.

Encircle No. 447 on Card, Opposite Page 65

### Standardize on

### COLLET CHUCKS

for SPEED, ACCURACY, ECONOMY

Automatic adjustment speeds up production in multiple operations with push-out type HALL COLLET CHUCKS. Full spindle capacity or over.

Tremendous grip over or under stock size to .007—without adjustments. All grip ...no slip. No bearings...no heat or lost power. Instant release without stopping lathe.

SATISFACTION GUARANTEED!

#### Made in Two Sizes to Fit Your Requirements:

Model A...1" (max. capacity 1-1/16") Model B...2" (max. capacity 2-1/16")

Round, square or hexagon collets, plain or serrated No. 3 Collet Pads Now Available Write today for illustrated estalog and price list—Dept. A-12

HALL MANUFACTURING COMPANY
623 TULANDSA DRIVE, LOS ANGELES 24, CALIFORNIA

Encircle No. 446 on Card, Opposite Page 65

317



#### Multiple Spindle Magazine Feed Power Screw Driving Machines

Latest type equipment for driving screws faster in products requiring two or more screws. These ma-chines operate easily and require very little attention or adjustment once they are put in production.





Model C Automatic Part Feeders provide an efficient means of feeding parts to Automatic Ma-chinery. They are fast feeding, have large storage capacity and are easy to load.

Pat. applied for.

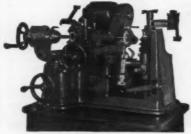


COOK & CHICK 2415 WEST 24th ST. CHICAGO 8, ILLINOIS

Encircle No. 449 on Card, Opposite Page 65

### HYBCO TAP GRINDER

Sharpens Chamfers, Flutes and Spiral Points



MODEL 1100

· Capacities No. 0 Machine Screw to 11/2" Hand Taps.

HENRY P. BOGGIS & CO. 710 E. 163rd St. Cleveland 10, Ohio

Encircle No. 450 on Card, Opposite Page 65 318

### STOP

OILY FLOOR MISHAPS



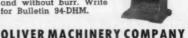
Tamms Industries, Inc. 228 N. LaSalle St. Chicago 1, III.

Encircle No. 451 on Card, Opposite Page 65

### New ... "OLIUER" **Hydraulic Cut-Off Saw**

Cuts nonferrous extrusions, tubing, bars. Accurate and fast!

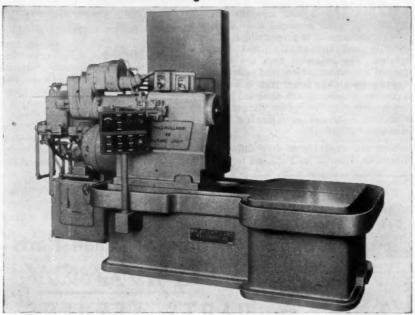
This smooth-running production machine pays for itself quickly. A light touch on start button moves saw in a straight line by hydraulic piston. A 14" saw cuts 3"x6"; 18" saw cuts 5"x6". Up to 28 strokes a minute. Table has micrometer stop to gauge cuts 1/16" to 201/2" long. Air clamp holds work. Cuts thousands of pieces without variation and without burr. Write for Bulletin 94-DHM.



Encircle No. 452 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK

Grand Rapids 2, Michigan

### **Fixed Center Horizontal Boring Machine**



The Millholland 3B boring machine has been designed as a standard fixed center automatic boring machine suitable for short run production work. Machine table is arranged to take fixtures which would locate for height and position the pieces to be bored.

Operation is by push button with preset automatic cycle, or manual with separate push buttons on panel for rapid advance, coarse feed, fine feed, dwell, and rapid return. In preset cycle, the speeds, feeds and stroke can be varied to suit requirements of part. W. K. Millholland Machinery Co., Dept. MTB, 6402 Westfield Blvd., Indianapolis 20, Ind.

Use ACTION Card, epposite page 64, Encircle No. 67

### **Chatter Resistant Boring Bars**

Easco Products, Dept. B, of Ypsilanti, Mich., has announced that it is now marketing the chatter-resistant boring bars produced by the Fry Tool Mfg. Co., of Eaton, Ohio.

It is claimed that by killing vibration and chatter, these bars may be used at

higher speeds for both light and heavy cuts.

The bars achieve their strength and rigidity by use of a special steel alloy. They are machined to proper shape, externally and internally, and heat treated. The hollowed bars are then packed with vibrationless lead pellets in heavy grease. The inner core is cut at a contour which research disclosed to be the specific requirement for eliminating vibration without sacrificing bar strength.

Bars are available in five different diameters, from 1" to 21/2", and in tool

bit sizes from 5/16" to %". Lengths range from 14 to 26".

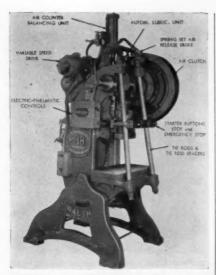
Use ACTION Card, opposite page 64. Encircle No. 68

### Air-clutch hi-flex presses

Air-clutch hi-flex o b i presses have been added to the Walsh press line. Electric-pneumatic controls may be set on inching, single stroke or continuous operation at high or low speed; press may be stopped at any position of the slide.

Variable speed drive allows press speed suitable for the proper die operation. Air balancing unit cushions slide movement on top and bottom of stroke. Auto-





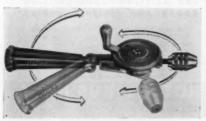
matic lubrication unit is mounted between uprights in back of the press. Keyway in crankshaft is provided for roll feed, scrap cutter, etc. Walsh Press and Die Co., Dept. MTB, 4709 W. Kinzie St., Chicago 44.

Use ACTION Card, opposite page 64. Encircle No. 78

### Drill for hard-to-reach places

A Proto all-angle drill to solve difficult drilling problems has been announced by the Plomb Tool Co., Dept. BB, 2209 Santa Fe, Los Angeles, Calif. Since both the chuck and handle are adjustable to various angles, the drill will reach around obstructions, work close to floors and walls, and operate in close quarters.

Use ACTION Card, opposite page 64. Encircle No. 79





### what's your TROUBLE?

To save time and money use the

#### ORIGINAL-TROUBLE-DETECTOR\*

for trouble shooting when damages arise or threaten to arise on machines, motors, turbines, dynamos, pumps, pipelines, etc., etc.

The ORIGINAL-TROUBLE-DETECTOR\* is indispensable, reliable and a most important assistant in every work shop and plant.

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Write for illustrated folder and details to

### H. G. STENGER

Precision Instruments 70-11 34th Avenue Jackson Heights 72, New York, N. Y.

Encircle No. 454 on Card, Opposite Page 65



### BAND-SAW MACHINE ACCESSORIES

used as standard equipment by leading band-saw manufacturers...

- CARTER RIGID
   BAND-SAW WHEELS
- JIFFY TIRES
- MICRO-GUIDES
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cut costs way down,

improve quality!

CARTER PRODUCTS CO., INC.
423 Wm. Alden Smith Bldg.
30 Ionia Ave., S.W.

GRAND RAPIDS 2, MICHIGAN

The 0" to ¼" capacity chuck swings in a 270° arc, and has a spring lock that enables the user to change angles with a flip of the thumb. The handle turns in a 180° arc at right angles to the chuck movement path. It is held in its several positions by an adjusting screw.

Use ACTION Card, opposite page 64. Encircle No. 108

### Vertical miller and jig borer

The tapered spindle bearing and hardened ground tool steel ways of the Linochine vertical miller and jig borer Model MC-1 are claimed to give chatter-free and vibrationless operation even when making heavy cuts with carbide tools. This machine has 12 spindle speeds ranging from 80 to 3450 rpm.

Accuracy of movement and plane to within .00025 is made possible by the 6" dia. working dials and the hardened, ground, lapped and stabilized lead



screws. Castings are made from heat treated, deep frozen Meehanite for tensile strength and rigidity. Machine is recommended for jig boring, drilling,



### Multifor BENDER-CUTTER

#### CUTS, BENDS, PUNCHES

Available in hand or air operated models, the MULTIFORM is shipped complete with full assortment of dies and mandrels to punch, bend and cut round or flat brass, bronze, aluminum, steel, etc., up to -fk'x1/2" x 4".

. A. RICHARDS CO.

Encircle No. 456 on Card, Opposite Page 65



### ROTARY BUSHINGS FOR DRILLING, CORE DRILLING ROUGH AND FINISHED BORING

The inner race of the GATCO bushing rotates with the tool, piloting and tool accurately below or above the work—or both.

Eliminates expensive tool construction—Reduces tool wear—Prevents seizure and pilot breakage—Especially adapted where precision is required.

Write for full information and prices

### ROTARY BUSHINGS

42326 ANN ARBOR ROAD, U.S. 12, PLYMOUTH, MICH.

Encircle No. 457 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

vertical milling and fly cutting to very fine surface finishes. Linochine Products Corp., Dept. BTM, 145 42nd St., Brooklyn, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 109

### Electric indexing table has central columns

An electric indexing table for automatic work-positioning features a central column on which tools may be mounted. The table is available both as a packaged unit with the manufacturer's electric impact hammer (Electropunch) which stakes, rivets, or marks automatically with the cycling of the table or, separately, for use with other automatic tools.

Table is completely self-contained, and is recommended for automation. The built-in automatic timer is continuously adjustable from 6 to 54 indices per minute and automatically triggers the tools when the table locks in position. A 1/20 hp gearhead motor, running continuously, furnishes the power.

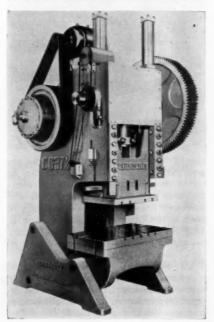


The 15" table is locked securely by a ground pin engaging hardened, tapered bushings set in the table. Repeat accuracy is .001"; no backlash can occur.

Specifications: height of table above bench 8"; shut height of electropunch spindle above table, with 12" column 4"; Throat 4"; table will take eight 3%" diameter station fixtures; time for motion during one index: 693 seconds. Black & Webster, Inc., Dept. BB, 445 Watertown Street, Newton 58, Mass.

### Press has electric friction clutch with interconnected brake, single point adjustment

This Ferracute 200-ton open back inclinable press (CG37½), with box-type ram counterbalanced, has as standard equipment an air-powered, electrically controlled friction clutch with intercon-



nected brake and single point adjustment, for punch presses requiring startstop operation.

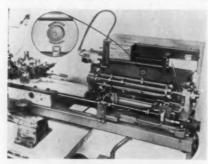
Press will accommodate any type automatic or semi-automatic feed attachments. For completely automatic operation, single or double feed rolls, ratchet-dial, friction dial, magazine or chute feeds can be combined with a hopper, lower cam or crank knock-up and inspection station. Ferracute Machine Co., Dept. B, Bridgeton, N. J.

Use ACTION Card, opposite page 64. Encircle No. 111

### Turret backfeed added to hydraulic drive

The new backfeed feature of the Lynn hydraulic drive for turret lathes, it is claimed, makes it possible to put many cross slide operations on the turret, thereby speeding up production.

A typical application is machining



the id of a piece where tool marks are not permissible. A rough cut can be made going in and a finish cut coming out. The feeds of the infeed and backfeed are adjusted independently of each other. Lincoln Industries, Dept. B, 1123 So. 7th St., Minneapolis 4, Minn.

Use ACTION Card. Opposite page 64. Encircle No. 112

### High-capacity vibration isolator

A compact, high capacity steel spring vibration isolator that is claimed to provide maximum isolation efficiencies has been developed by the Korfund Co..



Inc., 48-39 W. 32nd Pl., Long Island 1, N.Y.

This LM/H Vibro Isolator reportedly carries loads of over 17,000 lb. each. Its housing is an annealed, malleable iron casting. Its adjustable leveling bolt is claimed to eliminate shims and speed up installation. Unit is available with external adjustment or with internal adjustment for use under machines having no fastening bolt holes, or where holes are offset from center.

Use ACTION Card, opposite page 64. Encircle No. 113

### Interchangeable drill has solid tongue

The Zit interchangeable drill with ½" shank utilizes a solid tongue extending to the locking screw. This method of construction is claimed to take spreading and other strains, also centers insert.



Screw merely serves to prevent insert from being withdrawn from the shank; tool is not dependent upon it for holding the insert against the torque, sidethrust, and other strains.

No. 1-DS drill set will drill steel and iron, as well as wood and plastics, from 9/16" to 1-1/16" diameters by 1/16" increments. Drill inserts are available to 2½" dia., but drills over 1-1/16" dia. should not be used in metal. All drills will cut up to 50 spikes or nails (excepting hardened floor nails), before sharpening is required, the manufacturer claims.

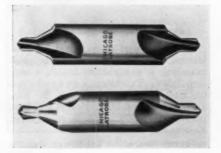
Interchangeable shanks allow the use of long shank to drill in otherwise inaccessible places. Athol Machine & Foundry Co., Dept. B, Athol, Mass.

Use ACTION Card, opposite page 64. Encircle No. 114

#### Combined drill and countersink

Combined drills and countersinks with spiral flutes in the plain type, sizes 1 to 18 carbon and in high speed; bell type, sizes 11 to 18 in high speed only, have been announced by Chicago Latrobe, Dept. BB, 411 W. Ontario St., Chicago 10. While there are only eighteen combinations of sizes that make up the new listing, they will take care of all general centering requirements, it is claimed.

Angle countersink is 60° included angle on all regular or plain and bell type countersinks. On bell type countersinks the angle of the bell is 120°. Diameter of drill sizes range from 3/64"



through ¼" and the length of the drill portion equals that of the drill diameter. Plain type is available in five piece sets, in carbon or high speed.

Use ACTION Card, opposite page 64. Encircle No. 115

### Three-D binocular magnifier

The Magni-Focuser binocular magnifier is claimed to give three dimensional magnification with needle sharp vision. Prismatic lenses are matched and bal-



anced. The magnifier can be worn with or without eye glasses; weighs only three ounces. Edroy Products Co., Dept. MTB, 480 Lexington Ave., New York. Use ACTION Card, opposite page 64. Encircle No. 116

### Lubricant for highly loaded gears

Molykote 165X, a new open gear lubricant for application on highly loaded gears which normally can only be lubricated infrequently, has been announced by the Alpha Molykote Corp., Dept. B, 65 Harvard Ave., Stamford, Conn.

The lubricant is a near-colloidal dispersion of Molykote Microsize in a viscous, tacky and adhesive petroleum oil which has been rendered fluid by the addition of a volatile non-flammable diluting agent, whose evaporation leaves a plastic film that will not crack or peel off at temperatures as low as 0°F, it is reported.

This lubricant is particularly useful where only one or two gears of a long gear train are exposed and lubrication of the train must be achieved through the transfer of lubrication from gear to gear.

Use ACTION Card, opposite page 64. Encircle No. 117

### Collapsible taps have interchangeable parts

The Type MC collapsible tap is made in five sizes covering a range of from 1 5/16" to 3½" inclusive. A micrometer adjustment in increments of .001 is claimed to permit quick, accurate sizing.



Approximately three-fourths of the component parts of all five sizes are identical and interchangeable. Thus one complete tap and four sets of body parts will provide all five sizes of taps.

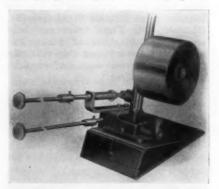
The shanks are detachable from the tap body and can be furnished to fit any machine socket. Float between the shank and the body compensates for any slight misalignment between the machine spindle and the work. Taps can be used either stationary or in rotary operation. Modern Tool Works, Consolidated Machine Tool Co., Dept. BB, Rochester 10, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 118

### Backstand converts grinder into abrasive belt machine

The Model 524 bench model abrasive belt backstand will quickly convert a grinder or polisher into a fast cutting abrasive belt machine.

Unit is designed for production work on light polishing or deburring opera-



tions. Belts up to 4" wide can be used. Mounting bracket for floor or wall mounting is available to facilitate easy installation. Extension controls for tracking and tensioning can be furnished. Hammond Machinery Builders, Inc., Dept. MTB, 1614 Douglas Ave., Kalamazoo, Mich.

Use ACTION Card, opposite page 64. Encircle No. 119

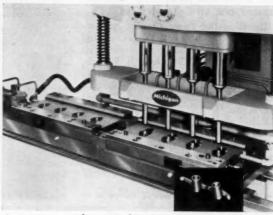
### Two-Station Shuttle Fixture for Reaming Rocker Arms

Michigan Drill Head Co., Dept. MTB, P.O. Box 4643, Detroit 34, Mich., has designed and built a shuttle fixture which finish reams 1200 rocker arms per hour. No further super finishing of the rocker arm shaft hole is necessary: the machine gives a finish of between 20 and 30 micro inches.

This 2-station automatic shuttle fixture is mounted on a standard Hydro 5. One station is loaded while processing

takes place at the other. Coolant is supplied to each spindle, and all parts are lubricated automatically.

Interchangeable nesting plates for any size or shape rocker arm will fit the fixture. A pilot on the reamer picks up



the part location prior to the actual sizing by the reamer. After the finish reaming, the rocker arms are ejected automatically, down a rear chute, into tote pans.

Use ACTION Card, opposite page 64. Encircle No. 85

### Guide pin lubricant

A 2" diameter by 8" long tube of Lubriplate die grease, suited for use on guide pins and bushings for die tryout in the toolroom, is available from the Producto Machine Co., Dept. B, 990 Housatonic Ave., Bridgeport, Conn.

A microscopic film affords lubrication in operation and protection against corrosion during storage of die sets.

Use ACTION Card, opposite page 64. Encircle No. 86

To Your Specifications except Screw Machine Cams

Design Assistance Offered

KIDDE PRECISION TOOL CORP.

Encircle No. 458 on Card, Opposite Page 65 August, 1955



Hinged Hammer Moulds 1, 21/2 and 5 lb. sizes—order your alloy lead hammer requirements from your machine tool supply house or direct from:

KITZMAN MFG. CO.

15061 Hartwell Ave. Detroit 27, Mich.

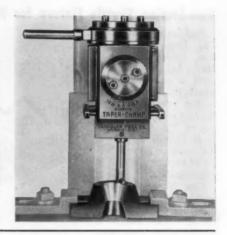
Encircle No. 459 on Card, Opposite Page 65

### Tool bores and turns tapered and straight surfaces

The Chandler Taper-Champ, for boring and turning both tapered and straight surfaces, has been announced by Chandler Tool Co., Dept. B, Muncie, Ind. It is used on jig borers, boring mills, etc., and for blanking, piercing dies, drop forge dies, patterns and other operations.

Rapid traverse of slide is provided in both directions through rack and pinion. Shanks are interchangeable so tool may be used in several different machines. Tool may be operated either vertically or horizontally.

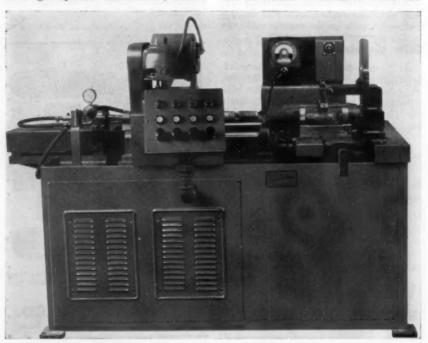
Use ACTION Card, opposite page 64. Encircle No. 81



### **Automatic honing machine**

A large automatic honing machine of single spindle construction, Model

SA, with a two-position fixture which can be loaded or unloaded while one



piece is being honed, has been announced by the Superior Hone Corp., 1616 Elreno St., Elkhart, Ind.

Automatic air gaging has been built into the honing mandrel which, after each honing cycle, moves into the bore and gages the part just honed. Movement of the honing head, fixture and air gages is hydraulically controlled and actuated by solenoids.

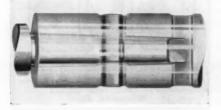
Constant pressure on the stone expansion is maintained by air which also controls rapid expansion and release of the honing stones at the beginning and end of each cycle. A push button type central control panel with signal lights, located on the front of the machine, governs the entire operation other than loading and unloading. A built-in electric timer allows variable cycling for the most efficient operation.

The machine has a fabricated steel base containing the hydraulic system and coolant unit, with the electrical control panel mounted on the back. The spindle is driven by a ½ hp, t.e., f.c. 220/440 volt 60 cycle, 3 phase motor; the hydraulic system by a 1 hp, t.e. 220/440 volt, 60 cycle, 3 phase motor and the coolant system by a 1/10 hp 220/440 volt, 60 cycle, 3 phase Ruthman centrifugal-type pump. Each machine is built to customers' specifications.

Use ACTION Card, opposite page 64. Encircle No. 82

### Adjustable draw key

An adjustable draw key for locking Morse taper shank tools securely in machine spindles has been announced by the Davis Boring Tool division of



Giddings & Lewis Machine Tool Co., Dept. B, Fond du Lac, Wis.

Consisting of but three parts—expanding wedge, plunger and adjusting nut—locks with one adjustment. Range of sizes fit machines with spindle diameters from 3" through 8", and draw key slots from 33/64" x 1\%" through 11/16" x 1\%". A wide range of wedge adjustment accommodates variations in shank and spindle slot location.

Use ACTION Card, opposite page 64. Encircle No. 83

### Electrically operated lead screw tapping unit

The Ettco-Emrick A.T.U. No. 3 lead screw tapping unit is a self-contained electrically operated and controlled device, designed for fact precision single and multiple spindle tapping and threading. Using instantaneous-acting forward and reverse electromagnetic clutches, it needs no reversing motor and can be operated at high speeds.

A depth control knob allows tap depth to be set to within ¼ turn any-



where within the maximum stroke of 1%". A self-contained oilproof control box affords easy synchronization of the unit with existing machines. Clutch torque can be regulated over a range of from 0 to the equivalent of 2 hp, giving the unit the sensitivity required for the smallest taps and sufficient power to drive the larger taps. Ettco Tool Co., Inc., Dept. B, 594 Johnson Ave., Brooklyn 37, N. Y.

Use ACTION Card, opposite page 64, Encircle No. 84



SELLEW (adjustable) stock drillheads will greatly increase your drilling output

STOCK SIZES AS SHOWN
No. 0-8 (2 spin.)—drill cap. ½"
No. 0-AD (3 spin.)—drill cap. ½"
No. 0-D (3 spin.)—Hrill cap. ½"
No. 1-D (3 spin.)—No. 1 M. tap.
No. 2-D (3 spin.)—No. 2 M. tap.
No. 3-D (3 spin.)—No. 2 M. tap.
Send us your drilling

Send us your drilling requirements.

Sellew Machine Tool Co. PAWTUCKET, R. I.

Encircle No. 460 on Card, Opposite Page 65

MAKE HARDNESS TESTS
With The
VINC POPTARIE

KING PORTABLE BRINELL Puts a load of 3000 kg. on a

Puts a load of 3000 kg, on a 10 mm ball. Can be used in any position — even upside down. Removable test head for testing very large parts. Guaranteed to make accurate Brinell tests. Throat: 4", gap 10", wt. 26 lb.

Box 606-H Ardmore, Pa.



Two Sizes

Encircle No. 461 on Card, Opposite Page 65

ZAJON SEGMENTAL CAM BLANKS

"SAVE DOLLARS by the hundredths"
(Trade Mark)

00 - 0 - 2 - 4 - 6 Alloy Cast Iron

Roy ZaJon Machine Parts
7801 S. Claremont Ave. Chicago 20, III.

Encircle No. 462 on Card, Opposite Page 65

BREMIL

The IMPROVED Compound Lever Shears



No. I cuts up to No. II gauge strip or sheet. No. 2 cuts up to  $\frac{1}{2}a^{\prime\prime}$  steel plate.

BREMIL MFG. CO. 1020 Holland Street, Erie, Penna.

Encircle No. 467 on Card, Opposite Page 65

### CAM MILLING

Fully equipped modern machine shop with extensive Jig Boring, Surface Grinding, Horizontal Boring and Thread Grinding facilities as well as modern Cam Milling and Cam Grinding equipment.

Your Inquiries Answered Promptly

HIMOFF MACHINE CO., INC. 23-22 44th Road Long Island City 1, N. Y

Encircle No. 464 on Card, Opposite Page 65

### JIG BORING

and

Large Precision Machining Done to your specifications WE HAVE 13 JIG BORERS

KIDDE PRECISION TOOL CORP.

25 LOCUST AVE. ROSELAND, N.J.

Encircle No. 465 on Card, Opposite Page 65



Encircle No. 466 on Card, Opposite Page 65



DRILL THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD
Your business letterhead will bring literature
WATTS BROS. TOOL WORKS
Wilmerding, Pa.

Encircle No. 463 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

A large precision angle plate made of diabase (black granite) for an aircraft manufacturing concern is shown on a 48"x72" diabase surface plate. Angle plate has a base 18"x24", and a face 24"x24". The faces are finished to a flatness tolerance of .00005". The tolerance for the 90° angle is .0002" in the 24" height. Rahn Granite Surface Plate Co., 639 N. Western Ave., Dayton 7, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 80



# Get the full story of the newest MOST ADVANCED TAPPING UNIT EVER DEVELOPED

Illustrated brochure reveals the exciting story of a remarkable new Lead Screw Tapper. Tells how you can now tap with an ease and precision that's unparalleled in tapping history! Graphically shows how each part produced by this lead screw unit is "gauge perfect"always! There's no variation - ever! You eliminate part spoilage, stripped threads, thread distortion. With the exclusive finger tip control you eliminate operator fatigue, too. Designed on a new operating principle it has many outstanding features: Trigger arm travels only 3/8"; depth held within .005"; depth stop automatically disengages clutch at bottom of stroke; friction clutch prevents tap breakage; hardened and ground lead screw replaces in seconds for pitch changes; unique wiper oils and cleans lead screw while in operation; plus many other features.

Write for your free copy today-now!

### Procunier Safety Chuck Co.

14 So. Clinton St. Dept. 8 Chicago 6, III.

Tru-Grip Tap Holder lighter, smaller, permits easier tapping close to walls and shoulders.

### Dial type marking machine for marking steel tubing

A new dial type marking machine has been developed by Noble & Westbrook Mfg. Co., Dept. B, 9 Westbrook

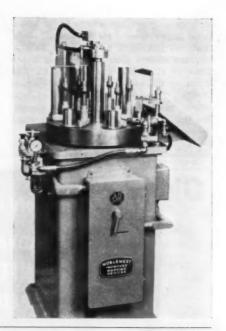
St., Hartford 8, Conn.

This heavy duty Model 391 Roll-O-Mark is designed with a capacity for roll-marking six lines of 1/8" high characters into steel tubing at speeds up to 30 cr 40 pieces per minute. It features a six station mandrel carrier dial mounted on a heavy duty ball bearing spindle driven by a 3/4 hp motor. A safety shutoff switch is suspended from the overarm which will shut off the machine if the operator comes too close to the die head or the overarm support.

The type holder is adjustable both vertically and horizontally; has a die head with a quick change type holder which can be set up with multiple character marking dies or individual

type.

Use ACTION Card, opposite page 64, Encircle No. 74





### NOTCH THESE ENDS WITH ONE STROKE OF PUNCH PRESS ARC-FIT TWIN NOTCH

NO DEFORMATION Shears from inside out-cuts clean edges; eliminates need for further finishing; aligns notches automatically

PERFECT "T" Joints for welding or brazing.

PRODUCTION NOTCHING Actual production time per pipe or tube end reduced to less than 3 seconds.

INTERCHANGEABLE

Punches and dies up to 2%" O.D. pipe or tube for STANDARD TWIN NOTCH.

(Special units available up to 3" O.D.)



PATENT PENDING

1825 N. 32nd Ave. Melrose Park, Illinois FIllmore 5-0160



### Tap analyzer

The Stocker and Yale tap analyzer provides a means for holding a tap in



a firm position and in a definite relationship to the several calibrated motions of the instrument. Geometric contours of taps to govern cutting efficiency and accuracy can be measured with tolerance specifications of .0001". Stocker & Yale, Inc., 380 Green St., Marblehead, Mass.

Use ACTION Card, opposite page 64. Encircle No. 77

### Electric micrometer checks machine alignment

A new electric micrometer introduced by the Ingersoll Milling Machine Co., Dept. B, 2405 Douglas St., Rockford, Ill., reportedly simplifies alignment of heavy machinery, aircraft jigs, transfer machines and many other kinds of equipment.

Developed to provide a means for checking vertical alignment and laterial horizontal alignment over substantial distances, it is claimed to give fast and accurate readings within .0002". Furnished with the micrometer are a mag-

### Get three or four times MORE service out of hack saw blades

The Wardwell EC Combination Grinder re-sharpens one gross of hack or band saws at least six times—and pays for itself!

Think of the savings it will make for you.

Wardwell Model EC Combination Grinder is the only single unit grinder adaptable for hack, band and circular saws that does not depend on the shape of the grinding wheel to form the shape of the tooth. This unique feature enables the operator to grind a variety of blades without dressing or changing wheels.





Write for Bulletin EC.

Makers of largest line of saw filing machines



MASTER TOOL MAKERS SAY they save up to 50% with the REGENT

### DUPLICATOR TABLE

in the production of

- Plastic, Rubber and Glass Molds
- Forging and Die Cast Dies
- Punches, Contoured Parts

### MOUNTS ON ANY BRIDGEPORT MILLING MACHINE

DUPLICATE any shape 2 or 3 dimensional Capacity 6"x6" ratio 1 to 1 with master Single lever table control for ease of operation Table floats on precision balls Mounts on mill in matter of minutes

Sold on 15-day trial basis.

See it operated at Coliseum Machine Show.

Write for descriptive literature

J. M. KALINS & COMPANY

115 East Washington Ave., Bridgeport 8, Conn.
Encircle No. 471 on Card, Opposite Page 65



netic-base platform and a C-clamp which makes it possible to mount the instrument almost anywhere and in any position.

Use ACTION Card, opposite page 64. Encircle No. 71

### Sintered carbide steel cutting material

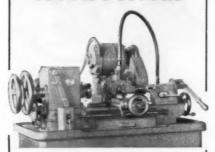
Sintered carbide steel cutting material K21, designed for increased pro-

K21 is shown here cutting an eccentric shaft, one inch off center. This interrupted cut of 7/16" per side was with a feed of 0.015. The first cut was at 310 feet per minute and the second at 360 feet per minute. Length of cut was 13%".



MACHINE and TOOL BLUE BOOK

### WALTHAM



### THREAD MILLING MACHINE

Ask for supplementary sheet describing the improvements and having an engraving showing the complete machine.

Write for Illustrated Bulletin

### WALTHAM MACHINE WORKS WALTHAM

Encircle No. 472 on Card, Opposite Page 65 ductivity on both high and low speed machines, has been announced by Kennametal, Inc., Dept. B, Lloyd Ave., Latrobe, Pa.

Created for wide ranges of application, it has a Rockwell A hardness of 91.5 plus high transverse rupture strength. It was specifically designed for general cutting, heavy roughing and finishing of steel products.

High edge-strength, combined with good resistance to cratering are claimed to make it particularly effective on plunge and interrupted cutting of castings having sand inclusions and hard spots.

Use ACTION Card, apposite page 64, Encircle No. 72

### Hand tapping machine components

The owner of a Mico engraving machine can mechanize his shop by simply procuring the new No. 901 hand tapping machine head and post assembly, which



may be mounted on any of the standard Mico engraver bases. Mico Instrument Co., 78 Trowbridge St., Cambridge, Mass.

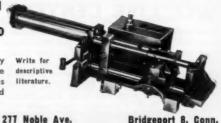
Use ACTION Card, opposite page 64, Encircle No. 73

### COOPER WEYMOUTH OPEN THROAT AIR OPERATED SLIDE FEED

For Power Press Operation

Operates on standard shop air lines. Easy to set up and adjust, holds to extreme accuracy. Made in five sizes. Feeds lengths to 36", up to 18" wide on mechanical and hydraulic presses.

COOPER WEYMOUTH, INC.



Bridgeport 8, Conn.

### Rotary index table accurate to .0005"

A 13-inch diameter rotary index table, designated as Model BRET-13, is now included in the line of packaged work devices marketed by The Bellows Co., Dept. BB, Akron 9, Ohio. Designed specifically for use where high accuracy in automatic feeding of work to tools is



required, it can maintain repeat accuracies as close as .0005".

A unique cam movement is claimed to assure a positively locked table top at all times.

The unit is available in three styles: one for fixed indexing of 4 stations; one adjustable for indexing either 6 or 12 stations; and one adjustable for 6, 9, or 18 stations. Other numbers of stations can be furnished on order.

Use ACTION Card, opposite page 64. Encircle No. 120

#### Six dies introduced

Six new dies have been introduced by Hossfeld Mfg. Co., Dept. MBB, Winona, Minnesota.

The Bulldozer die makes round or square bends on flatstock up to 3/16"



thick and 4½" wide. The stock is removed from the machine by merely pulling a pin; thus, sharp square bends or round eyes can easily be made. The die is also used for making intricate bends on wire up to ¼" diameter.

The Edgebend dies, two to a set, bend flatstock edgeways. Capacity is \\\^2x\) 1\\\^34'' cold. The smaller die bends down to a 5'' outside radius, the large die to a 9'' outside radius.

Special o.d. steel tubing dies, 11 sizes from %" to 2", bend from 1¼" to 24" radii.

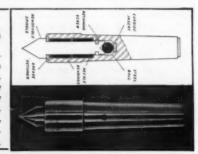
Special pipe dies make close return bends on pipe with radii from 1¼" to 36". Eight sizes are available from ½" to 2".

Conduit dies (90°) for bending standard pipe and rigid conduit are available in seven sizes from  $1\frac{1}{2}$ " down to  $\frac{3}{2}$ ". Radii ranges from 6" to  $1\frac{1}{4}$ ".

Thinwall electrical metallic conduit dies bend from ½" to 2" conduit, 3" radius on the ½" size, 10" radius on the 2" size. Full. round, smooth bends are

### WEE LIVE CENTERS

Extra capacity, needle bearings plus short overhang—30 to 40% less—makes the Wee more rigid and accurate under heavy cutting loads. Runout held to .00015, Test one—your money back if center does not prove its worth in 24-day trial. No. 2, M.T., \$21.00. No. 3, M.T., \$24.00. Request complete price list, many sizes, tapers, shanks. Write direct, if distributor cannot supply you. HERBERT CROSS & SON, Bala-Cynwyd 2, Pa.

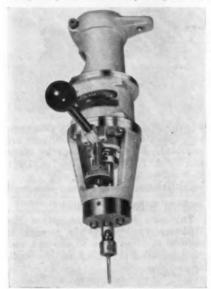


made without wrinkling. The tube is supported entirely from the outside; therefore, no mandrel is needed.

Use ACTION Card, opposite page 64. Encircle No. 124

### Lead screw tapper

This new lead screw tapping unit developed by the Procunier Safety Chuck



Co., Dept. B, 14 S. Clinton St., Chicago 6, Ill., can be manually operated or adapted to air operation when greater speed and convenience is desired.

By depressing the finger tip trigger arm which has a 4" travel, the tap is reportedly fed into the work gently, without any pressure on the tap itself. At the conclusion of the down stroke the clutch is automatically disengaged without overrun. The lead screw backs out when the trigger arm action is reversed.

Tap capacity is 0" to \(\frac{1}{4}\)" in soft material and 0" to \(\frac{3}{16}\)" in steel. Depth stop holds uniform depth to within .005".

Use ACTION Card, opposite page 64. Encircle No. 125

Precision Sharpen
Your Die-Sinking Cutters
on an ALEXANDER
Bench Grinder!



Also 2- and 3-dimensional pantograph engraving machines.

Write to Dept. A for catalog.

J. ARTHUR DEAKIN & SON 150-28 Hillside Ave., Jamaica 32, N.Y.

Encircle No. 475 on Card, Opposite Page 65



A MATCHED SET OF TRANSFER PUNCHES for toolmakers, machinists & tool cribs

Used for transferring location of threaded, drilled and reamed holes, slugs, blanks, etc.
Single Sizes Available
.0025 undersize to facilitate use.
Precision made of finest tool steel.

Precision made of finest tool steel.

Carefully heat treated and tempered for long life.

SET No. 3-17-28 punches with indexed standSizes 3/32" to 1/2" by 1/64" plus 17/32" size—
length 4-7/8" PRICE, only \$16.80

R. L. SPELLMAN CO.

URBANA, OHIO

Encircle No. 476 on Card, Opposite Page 65

### Roughing cutter feeds 100 inches per minute

A new Shear Clear face mill developed by the Ingersoll Milling Machine Co., Dept. BB, Rockford, Ill., feeds more than 100 inches per minute while rough milling.

In conjunction with proper milling equipment, the new cutter achieves



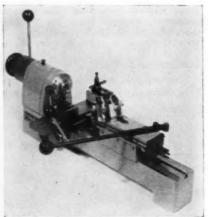
these high feed rates by means of new blade angles, coupled with a unique free cutting, shearing action. Cutting is done on the bevel portion of the blade, producing long, thin chips. Tungsten carbide-tipped blades can be used for a wide range of roughing work on various metals. The face mill is manufactured in sizes from 2½" dia. up.

Use ACTION Card, opposite 2496 64. Encircle No. 95

### Half-inch capacity instrument lathe

The Derbyshire Model A, a half-inch capacity lathe which is light enough for fine precision work, has a ball bearing headstock with a run-out of less than .0001" at the headstock. It is equipped with a lever collet closer, V-belt, sixposition turret having %" holes for tools, double compound slide rest with rack and pinion cross slide, and a front tool post having a swing of 360 degrees.

Over-all length is 24"; bed length 22";



swing 5.905". Spindle speeds with variable speed drive up to 10,000 rpm are provided, depending on pulley ratio employed. F. W. Derbyshire, Inc., Dept. B, Waltham 54, Mass.

Use ACTION Card, opposite page 64. Encircle No. 96

### Locking adjustable wrench

The new locking feature of the Williams Superjustable wrench is claimed to offer rapid adjustment, and positive lock. Just a flick of the thumb



or finger locks or unlocks the adjustment instantly in any position.

Wrenches are drop-forged from alloy steel in 8", 10", and 12" sizes, ranging in capacity from 0 to 1-5/16". J. H. Williams & Co., Dept. MTB, 400 Vulcan St., Buffalo 7, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 97

### **SURFACE PLATES**

### Black Granite <





Non-Magnetic
 Rust-Free
 Durable
 All Sizes

Send for Descriptive Folder, Prices

MOJAVE GRANITE COMPANY
1651 Miller Ave. Los Angeles 63, Calif.

Encircle No. 477 on Card, Opposite Page 65



POWER HACK SAWS

only \$334.00



Send for free catalog on power hack saws, vises, magnetic chucks, dividing heads,

L-W CHUCK CO.
23 So. St. Clair Street Toledo 4, Ohio

Encircle No. 478 on Card, Opposite Page 65

"This Seems Worth Looking Into"
GEM VISES
"Standard of Efficiency"

### "Standard of Efficiency" GEM MACHINE VISES



Complete range of sizes for all Machines. Plain, Swivel & Tilting. Write for complete information.

J. E. Martin Machine Co.
548 W. State Springfield, Ohio

Encircle No. 479 on Card, Opposite Page 65



\_T T C O \_

Sure Grip Step Blocks and Stud Sets Clamp Assemblies at low prices. TIETZMANN TOOL CORPORATION DEPT. C. T. ENGLEWOOD, OHIO

Encircle No. 480 on Card, Opposite Page 65

### READING BENCH KEYSEATER

Portable — move directly to job; a time saver for both small and large shops.

334" stroke; adaptable for

other work.

Low first cost—
prompt delivery.

Reading Machine Co. Cincinnati 37, Ohio

Encircle No. 481 on Card, Opposite Page 65





# MUMMERT-DIXON FACING HEADS with Automatic Feed

One-way Tool Feed—6, 9 and 10" sizes.

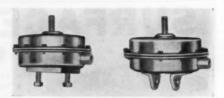
Two-way Tool Feed—9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes. Save many costly set-ups.

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

### Pneumatic air chambers require little space

Hortonair pneumatic air chambers, for holding or clamping of parts for welding, riveting, drilling, or in assembly operation, are designed for use where space is limited. Only three inches are needed from bottom to top of push rod.

They have a 34" stroke with a maximum force of either 228 or 1000 lb. at 100 psi air pressure. Two styles: bot-



tom or clevis mount. Horton Mfg. Co., Inc., Dept. MBB, 1179 15th Ave., S. E., Minneapolis, Minn.

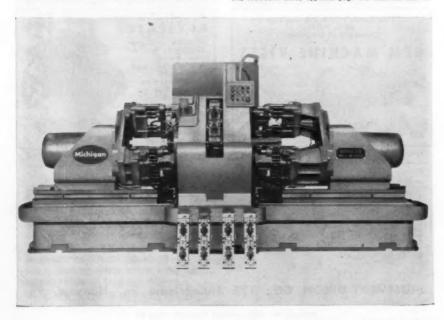
Use ACTION Card, opposite page 64. Encircle No. 18

### Four Station Trunnion Type Hinge Drilling Machine

This double end, way type hydraulic feed, trunnion type machine that drills and reams hinge pin holes in automobile door hinges was developed by the Michigan Drill Head Co., Dept B, 917 E. 8 Mile Rd., Detroit, Mich.

The part locating and clamping clocks are interchangeable on this 4-place, 4station machine. The fixtures are arranged so that finished parts are automatically ejected after the machining cycle prior to reloading. All electrical and hydraulic installations are built to JIC standards. Drill and reaming heads are pot type, equipped with ball bearings. Drilling spindles are axial adjusted and equipped with chip breakers.

Use ACTION Card, opposite page 64. Encircle No. 19



### Variable delivery gear pump discharges $3\frac{1}{2}-10\frac{1}{2}$ gal. per hour

A new variable delivery gear pump, Model FV1, Nathan Mfg. Corp., Dept. B, 45-02 Ditmars Blvd., Long Island City 5, N.Y., can be adjusted to deliver lubricant at any rate from 3½ to 10½ gallons per hour.

Rate of flow can be controlled by hand while the pump is in operation with the use of a simple regulating screw, and positive delivery is ac-



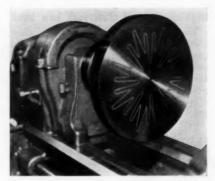
complished without throttling. This is claimed to result in a constant and uniform delivery, even when lubricant of different grades of viscosity are used.

Designed for a rotary drive, the pump is small and compact, measuring but 25%" x 31/2". It may be adjusted by hand or automatically in stages of 11/2 gallons per hour.

Use ACTION Card, opposite page 64, Encircle No. 105

### Crow Foot model lathe magnet

A 10" and 12" dia. electro magnetic chuck, for application on lathes, grinding machines and special machines, features low weight-ratio to its face diameter and more even distribution of magnetism on the magnet face to assure greater pull-down of thin work and a powerful grip on work which only has small engaging surface.



Distribution of magnetism is attributed to the magnetic pattern of the face, called Crow Foot. Forty-eight radial magnetic gripping edges equal 91 lineal inches of magnetic engagement on a 10" diameter face.

Magnet is adapted for mounting on small or large size spindles. Permafil treated coil is claimed to stand up under coolants, oils, mild acids and alkalis. Unit operates on 6 volts dc. Magnetic Holding Devices, Dept. B, 2034 E. 22nd St., Cleveland, O.

Use ACTION Card, opposite page 64. Encircle No. 106

#### Aluminum oxide process wheels

The MM process made by Macklin Co., Dept. B, Jackson, Mich., is now available for jobs requiring aluminum oxide abrasive.



A constant flow of abrasive between the wheel and work is achieved through the use of fine grain in pellet form, distributed throughout the wheel. Use ACTION Card, opposite page 64. Encirels No. 107

### High-speed steel clawtooth saw band

The Demon high-speed steel claw tooth saw band is claimed to excel in penetrating ability, cutting speed and tool life. The hooked teeth penetrate easily with less feed pressure—virtually pull themselves through the work. They stay sharp longer for increased cutting life.

The band retains its tooth hardness at temperatures to 1050° F. Spring-like hardness of the body allows heavier work feeds and chip loads, the manufacturer claims.



Four widths are offered, from ¼" through 1"; four pitches (teeth per inch)—a selection of eight blades. The DoAll Co., Dept. B, Des Plaines, Ill.

Use ACTION Card, opposite page 64. Encircle No. 101

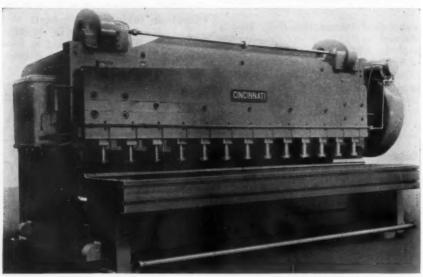
### Shear for corrugated metals

This 100 series Cincinnati all steel shear was specifically designed for shearing corrugated metals. It weighs approximately 45 tons and is arranged for shearing corrugated mild steel sheets 12' long. The shear operates at a rate of 20 strokes per minute.

The special table top is recessed to permit proper seating of corrugated stock and the 13 hydraulic holddown plungers are bevelled at a 45 degree angle to allow clearance of corrugations when shearing.

Additional features include a light beam shearing gage, two T slots in the front edge of the table, and a slitting adjustment for shearing longer sheets than can be accommodated in one operation. Cincinnati Shaper Co., Dept. B, Cincinnati 25, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 102



### Press brake features stroke control

A new hydraulically operated press brake said to develop 12 tons of pressure and with a 36" length of bed and ram has been announced by O'Neil-Irwin Mfg. Co., Dept. B, 562 Eighth Ave., Lake City, Minn.

Designated Di-Acro Hydra-Power press brake, the chief advantages of this machine is "stroke control," according to the company. The most practical length of stroke for each job can be preset and the ram can be stopped or reversed at any desired point in a work operation.

Power is applied to a rotary hydraulic cylinder which is mechanically linked to the cam shaft. The oscillating action of this cylinder has a maximum movement of 270°. Maximum power or pressure is obtained by working off the bottom of the stroke. The design of the machine is such that any length

of stroke can be secured with a quick adjustment of the stroke control selector, without having to re-adjust the bed or die settings.

Use ACTION Card, opposite page 64. Encircle No. 103

### Double miter cutting machine

This double miter cutting machine, Model DM-10, manufactured by the Stone Machinery Co., Dept. BTM, Manlius, N.Y., cuts two 45° miters in one pneumatic, fully automatic cycle. It cuts aluminum, brass and copper extrusions as well as plastics.

Activated by foot pedal valve con-



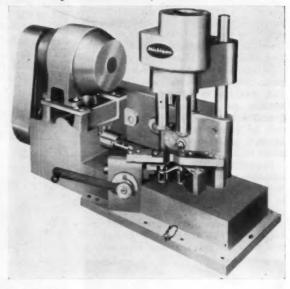
trol, the machine completes a full cutting cycle in less than two seconds. It has an automatic, double work clamping device that can be adjusted to any size or shape of stock: cuts 2%" wide x 2" high extrusions, 2" tubing in nonferrous metals. Special models cut material up to 5¾" high by 2%" wide.

Use ACTION Card, opposite page 64. Encircle No. 104.

### Two-Way Drilling Unit Fits any Standard Drill Press

A compact, self-contained unit that permits right-angle drilling on any standard drill press uses only one feed source on press. Mounting the unit is simple; it is locked by a cam wedge, either manually or automatically.

Pressure from the vertical unit, while drilling, advances the horizontal unit. Feeding of the cross or right-angle is accomplished by rack and pinion gears. All moving parts are lubricated automatically by means of a reservoir built into the unit. Michigan Drill Head Co., P.O. Box 4643-B, Detroit 34, Mich.

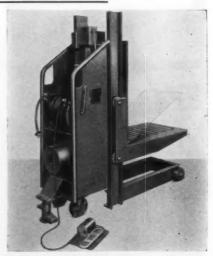


Use ACTION Card, opposite page 64. Encircle No. 20

### Heavy duty stacker

Portelvator "S", the Hamilton manually operated stacker for applications involving lifts to heights of 58" or less above floor level, now has a "big brother."

The new unit has added features which fit it for the extra heavy service for which it was designed: roller equipped platform 20"x36" with hinged cover plate; electric - mechanical lift through 3 hp crane hoist type motor: worm, worm gear, and screw power transmission; reversing magnetic starter; gear driven limit switch; retractable power cable on 15' spring reel; retractable reversing foot switch on 25' spring reel; platform operating speed of 58" per minute; platform travel 41" (minimum height 7", maximum height 48"); load capacity 3000 lbs. The Hamilton Tool Co., 826 S. Ninth St., Han-



over, Hamilton 1, Ohio.
Use ACTION Card, opposite page 64. Encircle No. 21

SID TOOL COMPANY, INC.

Your headquarters for Special Taps and Drills now stocks...

HIGH SPECIAL SIZE MILLING CUTTERS



### SIDE MILLING CUTTERS

Precision made in U.S.A.

### IN STOCK FOR IMMEDIATE DELIVERY!

	,		
DIAM-	OF FACE	SIZE OF	PRICE
4	7/32	1	11.40
4	9/32	!	13.35
4	5/16	1	13.70
4	7/16 9/16		15.05 17.15
4	11/16	i	18.10
4	13/16	i	20.85
4	15/16	i	22.95
4	1	1	23.65
4	1 - 1/8	1-1/4	25.75
4	1 - 1/4	1-1/4	28.35
5	1/4	1	17.50
5	5/16	1	17.80
5	3/8	1	19.70
5	7/16	1	20.95
5	9/16	1	23.55
5	11/16	!	26.30
5	13/16	1	28.35
5	7/8	1-1/4	30.50
5	15/16	1	31.50
6	1/4	!	21.60
6	5/16	1	22.10
6	3/8		23.70
6	7/16	1	25.30
6	9/16		31.20
6	11/16	1-1/4	33.45 35.75
6		1-1/4	36.65
6	7/8 15/16	1-1/4	38.50
8	1/4	1-1/4	47.70
8	5/16	i	49.70
8	3/8	i	51.05
8	7/16	i	53.70
8	1/2	i	54.55
8	9/16	1-1/4	56.65
8	5/8	1-1/4	57.50
8	11/16	1-1/4	59.35
8	13/16	1-1/4	60.50
8	7/8	1-1/4	62.20
8	15/16	1-1/4	63.85
10	1/4	1-1/2	87.85
10	5/16	1-1/2	88.90
10	3/8	1-1/2	83.75
10	1/2	1-1/2	92.30
10	5/8	1-1/2	105.35
10	3/4	1-1/2	121.50
10	7/8	1-1/2	131.95
10	1	1-1/2	136.70
12	1/2	1-1/2	153.95
12	5/8	1-1/2	169.75
12	3/4	1-1/2	174.35
12	7/8	1-1/2	220.10
12	1	1-1/2	236.60

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9	5/16	1-1/4	21.85
5	3/8	1-1/4	23.20
6	5/16	1-1/4	30.80
6	7/16	1-1/4	31.85
6	9/16 11/16	1-1/4	36.70
6	13/16	1-1/4	40.05
6	15/16	1-1/4	42.15 44.55
8	5/16	1-1/4	63.20
8	7/16	- 1-1/4	66.80
8	9/16	1-1/4	70.55
8	11/16	1-1/2	75.65
8	13/16	1-1/2	79.35
8	7/8	1-1/2	83.25
8	1	1-1/2	87.35
10	1/4	1-1/2	87.80
10	5/16	1-1/2	89.10
10	3/8	1-1/2	90.15
10	7/16	1-1/2	95.70
10	1/2	1-1/2	99.75
10	9/16	1-1/2	110.85
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12	1/2	1-1/2	160.45
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### Contour Cutting Machine Line Reduces Fabrication Operations

The line of Ultra-Graph oxygen cutting machines recently developed by the Heath Engineering Co., Dept. B, Fort Collins, Colo., is claimed to minimize the number of steps required in many fabrication operations.

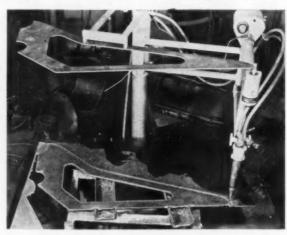
Following a template, a magnetic tracer permits the largest of the machines to cut a 72" straight line, a 38" circle and an 84" semi-circle. A smaller model cuts a 60" straight line, a 29" circle and a 70" semi-circle. In special applications, some models will reach speeds as high as 56" per minute.

A light-weight permanent magnet exerts a force of from 3 to 12 lb. against the template. For accuracy, the template follower has been mounted in the same center-line as the cutting orifice in the torch head.

Torches may vary from 8" to 16" in over-all length, and a vertical adjustment of the torch tip up to 4" is possible. There is claimed to be no appreciable distortion experienced in cutting operations.

Use ACTION Card, opposite page 64. Encircle No. 88

Producing this engine bracket formerly required 13 separate operations. The Ultra-Graph oxygen cutting machine has reduced this number to two.



### Closer gage block tolerances adopted

The adoption of new, closer gage block tolerances, for a finer degree of accuracy and 50% to 75% longer wear life for their line of square and rectangular gage blocks, has been announced by the Ellstrom Standards Division of Dearborn Gage Co., Dept. BB, 22038 Beech St., Dearborn, Mich.

The guaranteed tolerances for "W" or working accuracy blocks in size ranges above .010" to and including 1,000" are +.000008" -.000002". In sizes

above 1.000" to and including 20.000" the new standard tolerances are +.000006" -.000002" per inch of length. Blocks in all sizes check within .000006" for flatness and parallelism.

Tolerances for "I" or inspection accuracy gage blocks have been reduced to the following accuracy limits in the specified size ranges: above .010" to and including 1.000" ±.000004". -.000002"; above 1.000" to and including 4.000" ±.000003", -.0000015" per inch of length; above 4.000" to and including 8.000" ±.0000025", —.0000015" per inch; above 8.000" to and including 20.000" ±.000002", —.000001" per inch. Also within .000004" are the flatness and parallelism of this inspection block series.

Use ACTION Card, opposite page 64. Encircle No. 89

### Semi-automatic machine embosses leather, fabrics & plastics

Trademarks, tradenames and other designs can be embossed on such articles as heel pads, three-quarter sock linings, leather pocket patches, electrical components and plastics with a new machine developed by Markem Machine Co., Dept. B, 153 Congress St., Keene 49, N. H.

Equipped with conveyor feed and ejection for rapid production and operator safety, the model 79A prints from 20 to 80 objects per minute. Air operated, it requires no adjustment for variations in stock thickness.

The printing head may be equipped with self-adjusting die jaws for solid



embossing dies, or can be provided with a slide-in masterplate head to allow interchanging of variables. The machine is mounted on a column stand, and measures 65" high over-all. Minimum air requirement is 35 lbs.

Use ACTION Card, opposite page 64. Encircle No. 96

### Precision instrument for dimensional measurements

Mikrokator No. 500-502, a precision instrument for dimensional measurements, has been announced by the C. E. Johansson Gage Co., Dept. B, 10641 Haggerty St., Dearborn, Mich.

Provided with a mechanical, frictionless amplification device without sliding bearings or gears, there is reported to be no play, wear or binding. The



instrument is made in three different designs and in both inch and millimeter.

Measuring pressure is approximately 3½ ounces and the weight, 6½ ounces. It is provided with two adjustable tolerance pointers which are easily mounted and removed.

Use ACTION Card, opposite page 64, Encircle No. 91

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Threading Range . . . . 2TPI-48TPI Max. Thd. Dia. (Internal)... 16" Dia. Max. Thd. Dia. (External) . 12" Dia. Max. Swing Over Ways . . . 25" Dia. Max. Swing Over Tool Slide 12" Dia. Max. Thread Length . . . . . 61/2" Max. Taper of Thds. 16º Included Multi-Start Threads . . . . Yes Spindle Speeds . . 50-1400 R. P. M. Main Motor . . . . . . . . . 20 HP Floor Space Reg'd . . . 5'6" x 14'0" Approx. Weight . . . . . . 41/2 " Tons 

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### New GORTON P2-3 Pantograph Miller

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### Press brake accidents decline with magnetic back gauge

Finger and hand injuries from press brake accidents are claimed to be greatly reduced with the Electro-Magnetic back gage safety device developed by American Actuator Corp., Dept. B, 219 E. 44th St., New York 17, New York.

The attachment positions the work correctly at all times. Back gauge is easy to install and can be adapted for use



### MFG. CO. 360 Glenwood Ave., East Orange, N.J.

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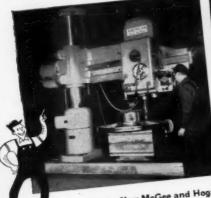


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### praise from . Caesar...

The Salt Lake Tribune, Sunday, June 20, 1954



Here's the New McGee and Hogan

### Radial Drilling Machine

With its 5-foot arm, this modern machine is capable of driving a 3" diameter drill to capacity through the center of a 10-foot diameter solid steel work piece. Also used for tapping and large boring operations, it is the only really modern radial of such dimensions in any intermountain machine shop doing repair work.

Veteran operator Pat Langford, above, finds the centralizing of all controls on this machine a big advantage over old-fashioned, scattered control points. Time saved means lower easts per job.



When a customer of such outstanding caliber and recognized reputation as the McGee & Hogan Machine Works of Salt Lake City, Utah spends his own good money to tell the world how good his new "AMERICAN" Hole Wizard Radial is that's really "Praise from Caesar."

The accompanying McGee & Hogan advertisement appeared in the Sunday, June 20th, edition of The Salt Lake Tribune. It shows the new 5' 13" "AMERICAN" Hole Wizard Radial at work in their plant producing work for customers at "lower costs per job."

Lots of power, wide range, convenient controls and plenty of ruggedness are doing for McGee & Hogan Machine Works exactly what "AMERICAN" Hole Wizard Radials will do for you.

And Mr. Ray Hogan adds another punch to this testimonial by telling us in a recent letter, "Your machines are doing a wonderful job for us."

Send for bulletin No. 327 and get the facts.

THE AMERICAN TOOL WORKS CO.

Cincinnati.Ohio U.S.A.

Lathe Radial Vills

# NEW Hook-Tooth

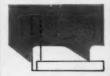
### BAND SAW BLADES

With Positive Rake and Rounded Guilets
Cuts Faster, Freer...Lasts Longer
For Non-ferrous Metals, Wood, Plastics

#### Hook - Tooth



#### Conventional Blade



Hook-Tooth Blade with a positive rake. Teeth hook themselves into the work. They saw instead of scraping and they cut full helical chips.

### Lasts-Longer

Hook-Tooth meets less resistance, generatrs less friction and heat. So, Hook Tooth lasts longer and gives more cuts per blade.

### **Cuts Faster**

The positive rake teeth incline toward the work for quicker penetration and faster cutting.

#### **Cuts Freer**

Hook Tooth digs in and takes big full 'chips from the material. Rounded gullets allow the chips to form and clear with ease.

#### Costs Less

Anyway you look at it—in terms of greater production, lower blade costs, less man-hours, fewer machines—it all adds up to real savings with LENOX Hook-Tooth Band Saw Blades.

AMERICAN SAW & MFG. COMPANY SPRINGFIELD, MASS.